PAPER Offic Cellulose Age "The Cellulose Age"

NORTH AMERICAN
Review Mumber





• From the complete line of Oliver Crawler Tractors and Oliver Industrial Wheel Tractors you can pick exactly the tractor you need and be assured of performance in advance.

The finest in industrial machinery is more than a slogan to Oliver... it is an accomplished fact that has been proved in year after year of outstanding performance. Design, materials, workmanship, and plant equipment are all based on one standard... the built-in dependability that adds up to more years of service in the field... lower operating and maintenance costs to you.

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The **OLIVER** Corporation

Industrial Division, 19300 Euclid Avenue, Cleveland 17, Ohio

A Complete Line of Crawler and Industrial Wheel Tractors

Pulp & Paper, April 10, 1930, Vol. 24, No. 5. Published monthly except in April, when publication is semi-monthly, at 71 Calumbia St., Scattle 4, Wash, Subscriptions; U. S. and Canada, \$1.00; other countries, \$4.00. Reentered as second class matter (let. 17, 1947, at the Post Office at Scattle, Wash, April 24, April 25, April 27, Apri

STONE & WEBSTER ENGINEERING CORPORATION

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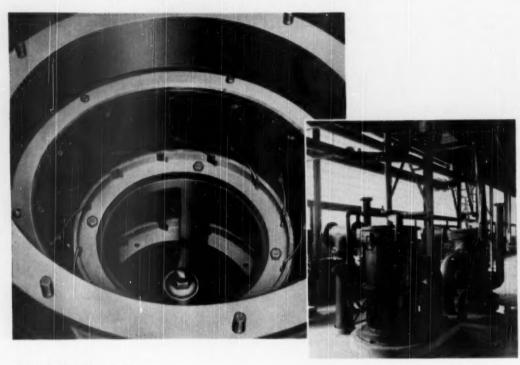
REPORTS · APPRAISALS · EXAMINATIONS

CONSULTING ENGINEERING



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REPORT

Two Miami Selectifier Screens serving liner stock vet on a new 146" five-cylinder 8-C board machine. No mix boxes required.

on Shartle Selectifier Screens

The wide range of furnishes used, and grades produced testify to the general adoption of the Selectifier Screen. In short the Selectifier screen has won its case and now rates the investigation of all mills not so equipped.

- · Excellent final cleaning job.
- Enclosed—no foam, overflow and wet area as with flat screens.
- · Compact Any mill can make room for them.
- Saving—Very little power required. No mix boxes required.

Segment of installation list showing wide variety of grades on which selectifiers are now operating is shown at right.

SHARTLE DILTS

OF MILL GRADE		FURNISH		
Book	Calender, inclus, or calered specialties	Unbl. sulphite 60 % Groundwood 30%		
Ledger Writing	Biotting	BI sulphite 60% Ray fibre 40%		
	Catalog	De-Ink plant		
	Boxboard filler	Mixed waste		
	Boxboard liner	News or traft		
Board	Juta liner	Corr. kraft waste		
	Food Boards	Bleached kraft		
	Straw	30% mixed corrugated 20% straw		
	Chip	Mixed waste		
	Yaweling	Unbl. sulphite 40% Groundwood 60%		
Tissue News	Facial	Sulphite groundwood		
	Crepa wadd ng	Bleached sulph to		
	Grayndwood	Groundwood		
Cover	Glassine and Greaseproof	Bl. sulphite		
Wrapping	Butcher wrap	Sulphite, sada		

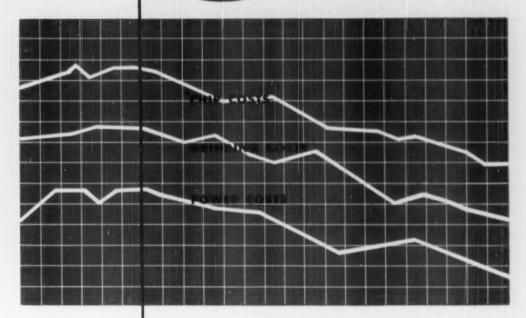
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E.I.S. Chipper Knives

Production costs take a tumble when you equip your chipper with Heppenstall E.I.S. Knives—and there are sound reasons why! These solid alloy steel knives hold their keen edges during long runs, insuring a higher yield of uniform chips... fewer oversized or bruised chips... less sawdust waste. You save on chipping costs—and get better quality pulp at the same time.

Because they do not dull readily, Heppenstall E.I.S. Knives require less grinding. This means fewer shutdowns for re-grinding! And with less steel removed from the blade, the result is longer knife life.

Add to these advantages a steady savings in power costs, due to the clean-cutting qualities of these superior knives, and you can see why they are the choice of leading mills throughout the country. Why not profit from the experience of others and order your Heppenstall E.I.S. Chipper Knives today?

HEPPENSTALL COMPANY

PITTSBURGH 1, PA.



Ather quick identification, note the tan color on ends of Heppenstall Knives and shipping boxes.

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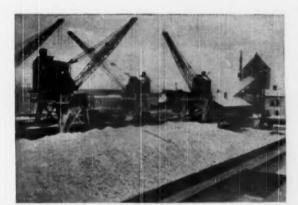
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SULP

*Interesting Facts Concerning This Basic Raw Material from the Gulf Coast Region

*LOADING



Sulphur intended for vessel shipment is brought to Gaiveston by rail from the mines at Newgulf. It is transferred directly from cars or from storage bins to the vessel.

The loading plant consists of two parallel storage bins spaced far enough apart to allow room for railroad tracks, tracks for the hoppers and cranes, and an endless conveyer belt. The belt along the center line between the bins is straddled by four cranes and their movable hoppers.

The cranes pick up the sulphur from the bins or cars and discharge into the hoppers, which automatically feed the belt. It is weighed while on this moving belt. After weighing it is discharged onto a smaller belt which in turn discharges through a cylindrical telescopic spout directly into the vessel's hold.

Loading operations at one of the huge vats of Sulphur at our Newgulf, Texas mine. Such. mountains of Sulphur are constantly being built at our mines, from which shipments are continually made.



EXAS GULF SULPHUR (C. 175 East 45th St. New York 17, N. Y. (Inc.

Mines: Newgulf and Moss Bluff, Texas

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Paul Bunyan Invented the Sky Haak Rig when, in the rain, he fastened Baba's rawhide harness to a topped free. The sun came out, and the harness shrank so fast that the log was at the mill almost before anyone could see it go by-

A reproduction of this incident from the fabulous life of Paul Bunyon—the fifty-first of a series—will be sent on request. It will contain no advertising-



They provide color matches for the papers you wish to put into commercial production, into commercial production, the formulae for which, are based on careful analysis of your submitted samples and specifications.

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ever. If you're in the business of making and selling roll products it will pay you to show your customers the quality points of a smooth, modern Camachine roll. Here's what your customers like about rolls that are made on fast, efficient new Camachines. They like the uniform density from core to circumference. They like the clean cut edges of the strip. They like the straight smooth sides of the finished rolls. They like the durability of Camachine rolls in rough handling and shipping. And they like the smooth way Camachine rolls unwind, clean to the core. Start delivering modern Camachine rolls now and ...



For a line on fast new Camachines for paper mill winding send for your free copy of the new bulletin "Mile-a-Minute".



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VESSEL DIVISION

NEWS

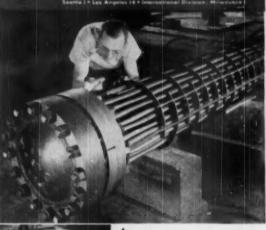


A.O.Smith

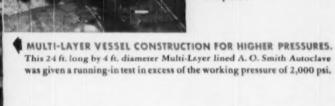
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HEAT EXCHANGERS FOR HIGHER PRESSURES.

A. O. Smith solid-backing ring construction makes the split-ring floating head safe for higher pressures. Four exchangers, like the one shown here at the right, were built for one company and tested at 1875 lb. for a working pressure of 1250 lb.



SHIPPING LIMITATIONS, PLANT LOCATIONS, OR BUILDING CLEARANCES ARE NO BARRIERS. A. O. Smith can provide field-assembled vessels built and erected to shop-quality specifications. Shown at the left are part of the segmental cones and heads for six coke drums, to be field assembled. Each vessel will weigh approximately 220,000 lb. when completed.



Send I				al Bullatins			
	V-46	Alloy,	Alloy-line	d, Clad, an	d Glass-lined	Vessels	
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One of the largest installations of modern

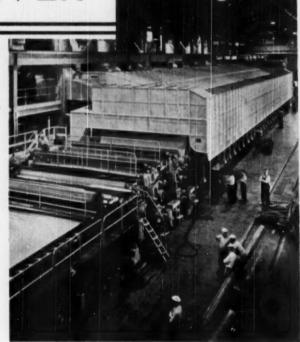
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for the history making project at

COOSA RIVER

Among the many outstanding features of the gigantic new mill of the Coosa River Newsprint Company is the very extensive use of Ross Air Systems to insure maximum production and operating efficiency. In practically every department Ross Systems are at work. They include systems for

- Machine Room Heating and Ventilating
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- Stock Preparation Room Heating and Ventilating
- Machine Hoods and Exhaust
- · Grewin Systems for paper machines
- · Calender Cooling and Trim Conveying
- . Motor Control Room Ventilation
- Grinder Stock Exhaust
- Grinder Motor Ventilation
- . Bleach Plant Ventilation
- . Hood and Exhaust for Brown Stock Washers



Coosa River's No. 1 Beloit Machine Showing Ross Hood

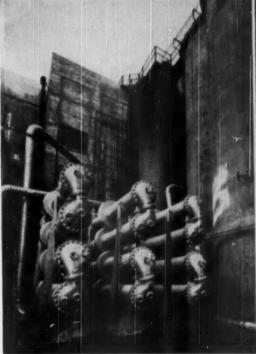
Equipment Designed In Collaboration With Kimberly-Clark Corporation and J. E. Sirrine Co., Engineers



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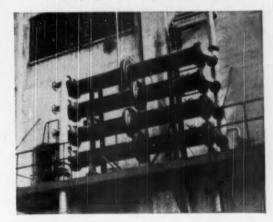
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ESCO 12-unit cooler with towers in magnesiumbase pulp mill at Langview, Washington.

Sulphite digester relief and blow-down cooler. Unusually large size permits operation on short cycle.



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GENERAL AMERICAN has been appointed exclusive licensee in the U.S.A. for the Aktiebolaget Rosenblads Patenter system for continuous evaporation of sulphite pulp mill waste liquors.

The Rosenblad system of channel switching eliminates the scale formed in evaporation by the condensate wash. It is used extensively in Scandinavian pulp mills.

The Conkey Flat Plate Heating Surface Evaporator has been designed to operate with the Rosenblad system. Write for bulletins now.

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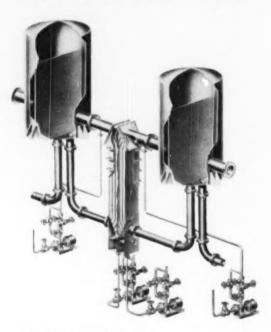
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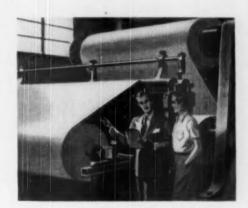


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Look us up at the TAPPI Meeting in New York in February. We will be glad to discuss your paper chemical problems with you.

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FROM the forest to the finished product, materials going into the manufacture of our corrugated containers and other packaging specialties are scientifically processed to assure maximum quality—strength—and efficiency.

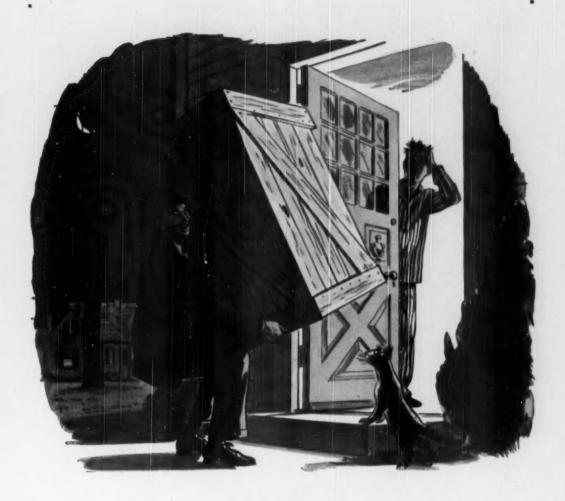
When you select the products of Kraft Containers Limited or Shipping Containers Limited for your shipping needs, you can rely on giving your merchandise maximum protection at minimum cost. The superior

design, strong construction, and merchandising appeal of our corrugated kraft shipping cases and containers are the result of years of laboratory research and of a wealth of practical experience.

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This process starts with the Johnnyon-the-spot service of our competent, experienced sales engineers. They expertly diagnose the troubles of ailing equipment—any make—and get it going if salvation is possible. If it proves beyond hope, they'll prescribe the new Moore & White elements that are needed to do an efficient, dollar-coddling job. The plant pounces on this prescription and follows through with painstaking dispatch.

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The MOORE & WHITE Company

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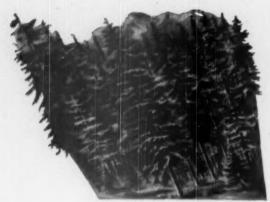
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1950 Review Number

PULP & PAPER

15



PURIFIED WOOD CELLULOSE USED FOR



Highly purified wood cellulose is one of the Country's most important chemical raw materials.

More than eighty per cent of all the viscose rayon and acetate yarns produced in this country are made from it. These yarns find their way into the daily living of everyone, in many types of wearing apparel for men, women, and children—and in a wide variety of other familiar articles.

The tire manufacturers use purified wood cellulose in increasingly large quantities in the form of high-strength viscose rayon cords and fabrics that lengthen the lives of automobile and truck tires.

Cellophane is made from purified wood cellulose, and so is another widely used transparent packaging material—cellulose acetate sheet and film.

Photographic film and paper—vulcanized fiber—lacquers—and many other related products also are made from this basic raw material.

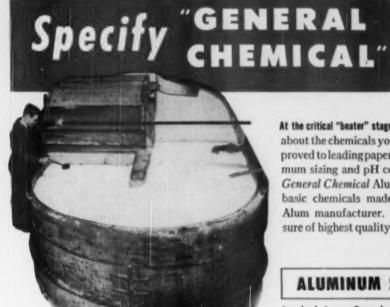
Supplying highly purified wood cellulose produced by chemical processes is Rayonier's job. A large part of the wood we use comes from our own forest properties, which are under management that keeps them continuously productive. Research by our scientists has resulted in a number of types of wood cellulose, each developed to give best results in making the end products for which it is used.

RAYONIER

INCORPORATED

EXECUTIVE OFFICES: 122 East 42nd Street, New York 17, New York • MILLS: Hoquiam, Port Angeles, Shelton, Washington; Fernandina, Florida
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For Your Beater ... Better



Other General Chemical Products For the Paper Industry

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Sadium Thiosulfate (Hypo)

Sodium Metasilicate

Sadium Silicate

Sedium Sulfide

Sulfuric Acid

Tetrasadium Pyrophosphote Anhydrous

Trisodium Phosphote

Copper Sulfate

Sodium Sulfite Anhydrous

At the critical "beater" stage, you can't be too careful about the chemicals you use. Time and tests have proved to leading paper producers—that for maximum sizing and pH control, it's best to specify General Chemical Aluminum Sulfate, and other basic chemicals made by America's foremost Alum manufacturer. That way you're always sure of highest quality, purity and performance!

ALUMINUM SULFATE

Standard: Lump; Ground, 99% thru 8 mesh, 95% thru 10 mesh; Powdered, 95% thru 100 mesh; Liquid, 32° Be.

fron Free: Lump; approx. 21/2", Ground thru 8 mesh, Liquid, 32" Be.

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(Salt Cake) . . . Paper Makers' Grade, thru 8 mesh, 95-99% Na₂SO₄.

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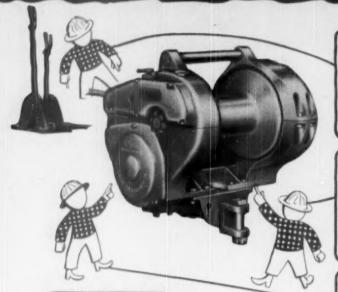
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NEW CARCO F WINCH

STREAMLINED CASE - CABLE CONTROLS - AUTOMATIC BRAKE



omy - Concealed push-pull cable controls clear your legging treator fender of usag-catching projections. Vulnerable control rads are gone, and with them cottly mointenance. Cable controls simplity winch installation, and give you a choice of lever stand pasition. Cables eliminate excessive linkage between control stand and wisch. Only Carco has cable winch controls.

Cable Centrals streamline for econ-

Automatic-brake streamlines operation—Essential for faster arch logging, and useful in all winching, the automatic brake lets the operator set his brake before pulling in the load. The brake takes effect the instant the tractor clutch is thrown out, preventing load drop or slip-back. Available at extra cost on the new Carco F Winch.

CARCO

The Carcometal Case is streamlined to minimize winch and line damage. Drown flanges are shrouded, exterior nuts and bolts are flush with the case, and the case is smooth. The F Winch has been beefed up for strength, yet still weight 415 to 285 pounds less than the other winches in its class. Less dead weight, lets you climb steep logging roads faster, improves your tractor belance.

THE CARCO F WINCH has always been a leader in the woods. Now — the new F Winch with concealed control cables, automatic brake, and streamlined case sets a new pace in its class.

There is a Carco F Winch to match these crawler tractors: Allis-Chalmers HD7 and HD10; Caterpillar D6 and D7; International TD14 and TD18; Oliver-Cletrac DD and DG; and earlier models of all tractors in this horsepower range.

With standard or special gearing, the F Winch gives you a wide range of line pull capacity. Line speeds range from 35 up to 357 feet per minute depending on winch gearing and tractor. Write for additional information or see your tractor dealer.

There's a Carco winch or hoist for nearly every crawler tractor ever made.

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The Sigmose Kee equals 40 thehen.

while in Japan it mound 10% more for your maney. Langston Siliters und Roll Windows ove long been noted for extra Tolices—

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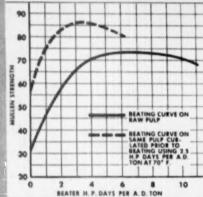
Langston

CURLATION

New Process for Pulp **Treatment**

Effect of Curlation Prior to Beating, on the Beatibility of PREVIOUSLY DRIED NORTHERN UNBLEACHED SULPHITE PULP

MULLEN CURVES



TEST DATA

	HP DT*	INTENESS	MULLEM	TEAR	DENSO- METER
RAW PULP	0	843	32.4	127	4.2
	1	822	46.2	133	9
	2	813	55.0	114	14
	3	792	66.6	98	23
	5	723	71.8	87	68
	7	628	72.5	75	161
	9	548	73.6	71	454
	10	492	68.2	64	744
	11	413	69.7	64	1808
	14	240	63.5	54	4772
PREVIOUSLY CURLATED PULP	0	840	56.3	142	3.5
	1	805	74.5	116	15
	2	763	82.8	101	27
	3	690	86.0	97	106
	4	608	85.8	83	184
	5	562	80.8	74	544
2	7	430	78.3	72	1612
-	12	187	65.3	49	2880

The Curlutur is a tool for olitoring the properties of pulp and paper to obtain qualities hitherte unachievable by mecha ans. The effects of curiation vary with the raw material and may be described only in relation to a particular pulp.

MOTE: Description of the testing procedures employed by the Curister Corporation Laboratory will be provided upon request

. Illustrated here is the CURLATOR -- the machine that permanently curls and twists pulp fibres to produce improved sheet characteristics. CURLATION is a fully tested and thoroughly

proved mechanical process.

Its accomplishments in improved quality and outstanding savings justify the attention of paper mill executives responsible for sales and profits.

The chart shown here will be followed by others equally informative. Meanwhile, illustrated literature is yours for the asking.

WRITE for new bulletin C-2 on the C-50 Curlator.

CURLATO PLOSSOM ROAD . ROCHESTER 10, NEW YORK

*T. M. Reg.—Curlator Corporation, Rochaster, New York

harnessing HEAT DOLLARS at St. Regis

with FOSTER WHEELER BLOWDOWN RECOVERY SYSTEMS

Properly engineered recovery equipment not only costs you less in the long run but increased operating efficiency and large fuel savings may also be enjoyed from the outset.

If you are contemplating improvements at your mill, our specialists on pulp and paper mill equipment will be glad to help you with your engineering problems.

Foster Wheeler Blowdown Recovery Systems are discussed in the May, 1950 issue at Meat Engineering, Write for a copy.

FOSTER WHEELER CORPORATION . 165 BROADWAY, NEW YORK 6, N

FOSTER WHEELER

You can profit by our *first* fifty years

For over fifty years . . . 1845-1904 . . . we designed and furnished paper mills – and we mean *complete* mills – from the drawings down to the last tool and part.

Since 1904 we've specialized in stock preparation machinery. During that time we've developed and manufactured the outstanding units in the field (some of them are illustrated on this page).

But we haven't forgotten our *first* half-century. Because of it, every Jones installation is engineered — tailored—to an intimate knowledge of the overall operation of which it is a part.

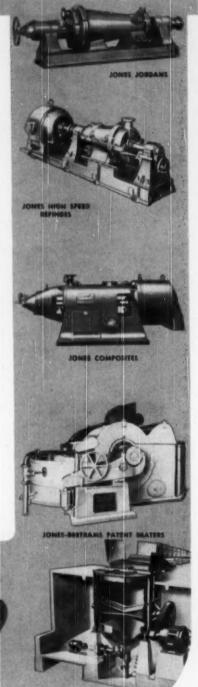
If you have a problem in stock preparation, you will profit by calling on Jones experience, Jones engineering. Write us for particulars. No obligation, of course.

E. D. JONES & SONS COMPANY



PITTSFIELD , MASS.

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY



JOHES PULP-MASTERS

A CONTINENT-WIDE SERVICE

representing 278 years of experience

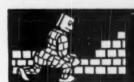


The thirteen men whose photos and service records appear on this page are well known to pulp and paper mill operators from coast to coast and gulf to gulf as field supervisors for STEBBINS.

Their years of experience in this specialized field of corrosion-resistant linings and tile tank construction assures each mill operator long lasting, trouble-free service from any one of the many STEBBINS' installations,

whether it be in the acid plant, digester building, bleach plant, or paper mill.

We are proud of the service records and loyalty of these men and the 92 experienced craftsmen comprising our field organization across the continent. They in turn are proud of STEBBINS' reputation for quality materials and quality workmanship on all of their installations.



Stebbins Engineering and Manufacturing Company

WATERTOWN, NEW YORK

STEBBINS ENGINEERING CORP. - TEXTILE TOWER, SEATTLE, WASH,
CANADIAN STEBBINS ENG & MFG. CO. LTD. - CASTLE BLDG. MONTREAL CANA

TENAX FELTS

from the finest of wools

give you long lasting, efficient service



From all parts of the world, the finest wools are selected and sorted. Then for each Tenax Felt, the correct proportions of the right wools are mixed together to give you the most efficient felt possible, for the kind of paper your machine produces.

The Lockport representative in your territory is fully qualifled to advise on all technical questions relating to felts. He is at your service as is our plant and all its people. We invite your inquiries.

LOCKPORT FELT COMPANY . NEWFANE, NEW YORK

Reduce Noise and Vibration

with Pacific-Western Dryer Gears

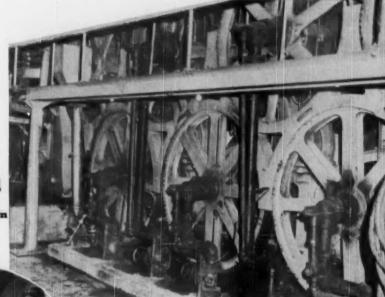


Illustration above shows bottom roll Pacific-Western opecial driver goars maching with top roll steel goars in paper drying machine.

In photograph at left Pacific-Western special drives gears, driven by pinion, serve as initial drives units for two gear trains on paper drying machine.

PAPER drying machines are capable today of greater speed and more production than ever before. This increased output throws a severe strain on steel dryer gears and often results in excessive vibration and noise which shortens the life of the gears. Replacement of dryer gears is costly and frequently causes expensive downtime.

Pacific-Western application engineers studied the causes of gear failure and determined how to make dryer gears last longer. Special gear materials were developed for this purpose. In addition, perfect mating of geared surfaces was assured by hobbing dryer gear teeth more accurately than had been the practice.

For more than twenty-five years these carefully designed Pacific-Western dryer gears have been used both by paper machine manufacturers in original equipment and by operators for replacement gearing. To provide fast customer service, patterns are available at Pacific-Western plants for most standard machines.

Reduction of vibration and noise in your own plant can be achieved with Pacific Western dryer gears. Skilled Pacific Western application engineers are ready to give your power transmission problem immediate attention. Their recommendations are backed by over half a century of Pacific-Western service to the paper industry.

Write, wire or phone your nearest Pacific-Western Office

Plants at SEATTLE, SAN FRANCISCO and LOS ANGELES

Sales Representatives at PORTLAND, DENVER, HOUSTON and VANCOUVER, B, C.



A TOOL WORKS

0

WESTERN

PACIFIC WESTERN

GEAR PRODUCTS

1950 Review Number

PULP & PAPER

25

LINK-BELT CHAINS

for Superior Service in pulpwood log handling



Barked logs leaving hydraulic barker on multiple strands of Class H malleable pintle chain.

From boat to woodroom, lags are carried by #4124 pinfle chain of Promal, the stranger, longer-wearing

Pulp and paper mills interested in efficient operation and low overall costs find that Link-Belt chains and sprockets for drives and conveyors give them these qualities in extra measure. From the various Link-Belt types, with numerous variations as to size and attachments, can be supplied a chain precisely suited to each application. Link-Belt's long experience and unmatched facilities assure you superior performance and long life on any installation.

Consult Link-Belt on conveying, materials handling and power transmission problems.

LINK-BELT COMPANY

Chicage 9, Indianapelis 6, Philadelphia 40, Atlanta, Dollas 1, Houston 1, Minneapelis 5, San Francisco 24, Los Angeles 23, Soettie 4, Terento 8, Offices, Factory Branch Stores and Distributors in Principal Cities.

CHAINS AND SPROCKETS

Nine strands of Class C combination chain of molleable iron and steel, form this serting conveyor taking logs from barking drums to chipper, or to groundwood log storage on upper floor.



Tenso-Temp Controls
Pay for Themselves

by Maintaining Accurate
Moisture Content



Masonellon Moisture Controller

In paper mill after paper mill, Masoneilan Tenso-Temp Controls are paying for themselves by reducing waste, providing more uniform quality and minimizing rejects. That's why you find Tenso-Temp specified and used in new installations and in modernization programs. Consider these additional advantages that make Tenso-Temp worth investigating for your mill.

Tenso-Temp is accurate because moisture contact measurement is averaged for the full width of the sheet. Response is instantaneous... variations in weight across the sheet do not produce false indication and inaccurate control.

Tenso-Temp is sensitive to the slightest variations in moisture content... precisely adjustable to maintain the desired moisture.

Tenso-Temp is economical because original cost is moderate and maintenance and operating costs are at a minimum.

Tenso-Temp is adaptable to any type of paper from condenser to board.

MASON-NEILAN REGULATOR COMPANY

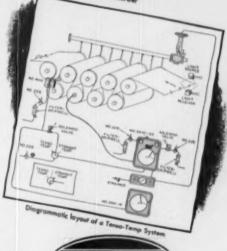
1181 ADAMS STREET, BOSTON 24, MASSACHUSETTS, U. S. A.

Sales Offices or Distributors in the Following Cities: New York - Syracuse - Chicago - St. Louis - Philadelphia - Housson
Denver - Pinsburgh - Cleveland - Cincinnati - Tulsa - Atlanta - Detroit - Los Angeles - San Francisco
Salt Lake City - El Paso - Boise - Albuquerque - Charlotte, N. C. Mason-Neilan Regulator Company, Ltd., Montreal and Toronto

1950 Review Number

PULP & PAPER

27



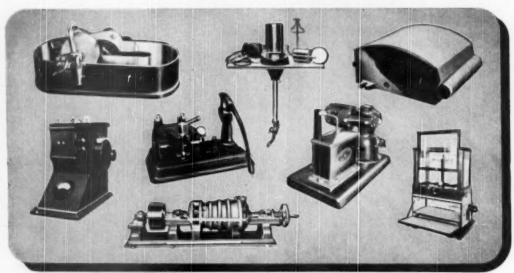


My mill pays dividends, too!

"I T'S just a miniature mill, but it pays big dividends. With Valley Laboratory Equipment, we know our pulp quality at all times and how it will behave on the machine. It saves a lot of money and we're turning out better paper."

Most mills already have Valley Laboratory Equipment, but if you haven't-write for our comprehensive bulletin on this important phase of mill operation.

VALLEY IRON WORKS CO.
Appleton, Wisconsin



VALLEY Laboratory Equipment





This seal assures your customers a product made from high alpha pure wood cellulose. SOLKA is a specification-built celiulose; the best of its kind This fair-skinned beauty could ask for nothing softer than facial tissue made from SOLKA pulp. A personal product like tissue must be soft, strong, absorbent, pleasing in texture—qualities which SOLKA develops to the maximum.

Brown Company also offers you full use of their Technical Service Division, to help solve your difficult paper problems. Call on them at any time.

BROWN COMPANY Foremost Producers of Purified Cellulose

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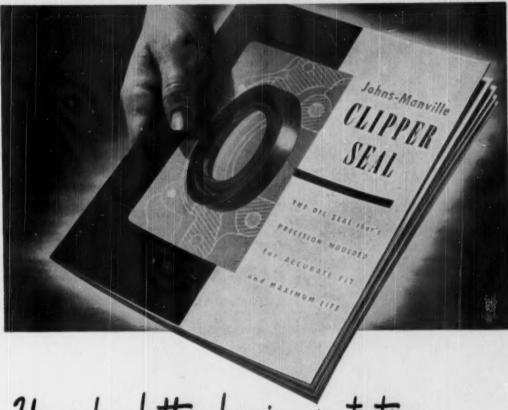
Our Contribution to...





Rooms for the following:

Crown-Zellerbach Cerporation Inland Empire Paper Company Millwood, Washin Masenite, Inc. Ukiah, Calif. Fibreboard Products, Inc. Antioch, Calif. Paper Makers Pty., Ltd. Burnie, Tasmania, / Australian Newsprint Mills, Ltd. Boyer, Tasmania, / Columbia Cellulose Co., Ltó. Port Edward, Nanaimo Sulphate Pulp, Ltd. Harmac, /	gron
4. Masonite, Inc. Ukiah, Calif. 5. Fibreboard Products, Inc. Antioch, Calif. 6. Paper Makers Pty., Ltd. Burnie, Tasmania, J. 7. Australian Newsprint Mills, Ltd. Boyer, Tasmania, B. Columbia Cellulose Co., Ltd. Port Edward,	gton
5. Fibreboard Products, Inc. Antioch, Calif. 6. Paper Makers Pty., Ltd. Burnie, Tasmania, J. 7. Australian Newsprint Mills, Ltd. Boyer, Tasmania, B. Columbia Cellulose Co., Ltd. Port Edward, S.	gton
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Australian Newsprint Mills, Ltd Boyer, Tasmania, Columbia Cellulose Co., Ltd	ornia
8. Columbia Cellulose Co., Ltó. Port Edward,	Aust.
	Aust.
9. Nanaimo Sulphate Pulp, Ltd. Harmac, I	B. C.
	B. C.



Yours for better bearing protection

-this new book about OIL SEALS

Here is a book filled with useful data about oil seals that you're sure to want for your files. It gives the complete story of the Johns-Manville Clipper Seal... tells how this precision oil seal with the one-piece moulded body is providing better bearing protection at lower cost in many types of applications.

Here you will find photographs and diagrams of typical Clipper Seal installations; information on the various lip designs that provide a choice of bearing surfaces; the wide range of sizes that are available; the thick or thin flanges designed for the precision sealing in many bearing housings.

Here are Clipper Seals that help cut maintenance costs and down time . . . seals that are designed specially for quick, easy application where space is limited ... for resistance to corrosive attack ... for high temperature operation and other special conditions.

Whether you are concerned with the design or maintenance of equipment, this new Clipper Seal book can help you get better bearing protection at lower cost. Send for your cupy today.

JUST FILL IN THE COUPON BELOW



Johns-Manville
CLIPPER SEALS

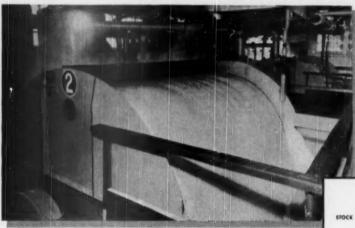
lohns-Manville	********
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Please send me the n	ew Clipper Seal Book (PK-46A)
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Company	Position
Address	
City	State

WASH SULFITE PULP

with O Less Wash Water

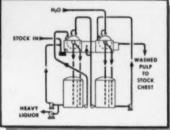
O Cleaner Pulp

A Closed System



These advantages of the Swenson-Nyman pulp washing system, used so successfully for kraft and soda pulps, are now available to mills producing sulfite pulps. Well washed pulp can now be obtained with a reduction in the quantity of wash water by utilizing the principle of two-stage washing on a single drum. This results in higher total solids in the liquor to the alcohol plant, evaporator room, or other waste liquor process.

Bulletin E-108 describes Swenson Equipment for pulp mills-send, today, for a copy.



Flow sheet for a 2-drum 4-stage sulfite pulp washing installation.

· Evaporators

· Pulp Washers · Filters · Causticizers

• Digester Blow Condensers

• Surface Condensers

• Turpentine Condensers • Deckers

ENSON EVAPORATOR COMPANY

DIVISION OF WHITING CORPORATION

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PULP & PAPER

1950 Review Number

SOLAR COLORS

for tinting white paper

brightness summing for prations

fastness superior featness to light

dispersion gulds, uniform distribution of dye throughout

non-caking meletrat to dominess and high hundrity

process stability across fuctuations of temperature, acidity,

alkalinity of machine spend do not affect uniformity of shade

versatility Solar Bluer and Solar Violet used alone, in-

conjunction with one another, or shaded with Solar Pink

ce Solar Green, produce a full range of eye appealing whites

deliveries stocks carried in warshouses strategically located

throughout the country insure propint deliveries

GENERAL DYESTUFF CORPORATION

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MINION, MASS - CHARLOTTE N. C. - CHICAGO NIL - PRILADELPHIA, NA - PRIVADE OR - PROFESSOR C. L. CAN PRANCISCO CALL



Duplex Cutter...

another New Bagley & Sewall Product

Here's a new cutter . . . another new Bagley and Sewall development in paper mill equipment. It isn't just another cutter. This Cutter has many innovations designed to make cutting easy, clean, and accurate.

It's rigidly constructed. Has heavy box section framework, and the frames are sectionalized. We can furnish these Cutters in Simplex, Duplex, or Triplex design. Drives on knives and draw rolls are positive—gear and chain—no belts to slip. And the simplex quick-change dual slitter makes easy changing from one set of slitters to another without breaking down the sheet.

These are only a few reasons why this Duplex Cutter is doing such a good job so easily. There are many other features you should know about. Write us for literature regarding this Bagley and Sewall Cutter.

BAGLEY & SEWALL

DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY

Finland Representative
Aktiobalaget Ekstrome Markinaflar
Helsingforn, Finland

WATERTOWN, NEW YORK

Foreign Representation Castle and Overton, Inc. 430 Fifth Ave., New York, N. Y.

There's been some changes made! NORTON PULPSTONES



1926

N 1926 Norton introduced to the paper industry the first manufactured pulpstone. It was made only in CRYSTOLON abrasive, in one structure and in a very limited number of grain sizes. Its use was confined largely to producing newsprint pulp in grinders with a power input of about 400 H. P.

But the paper industry was quick to take advantage of the new tool that Norton had developed for it.



It's easy to tell at a glance the visit imprivement that has been imade in the automobile between 1926 and 1950. Visually the difference between the original Norton Palpstane of heavily-law years age and the Norton stone today is not se apparent but its technological improvement has been tremendous.



"Blaking better products to make other products better"

NORTON COMPANY, WORCESTER, MASS. . NORTON COMPANY OF CANADA, LTD., HAMILTON, ONT.

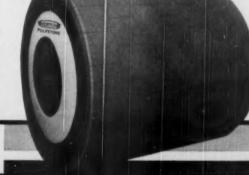


1950

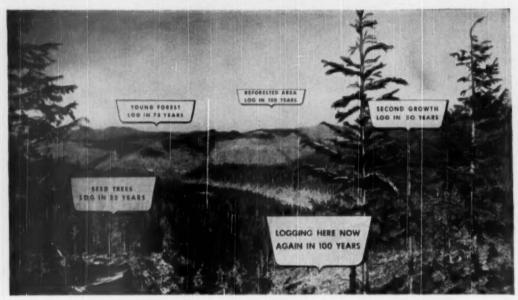
LOSE co-operation between Norton technicians and those of the paper industry led to rapid and continual improvements in the Norton Pulpstone and thereby expanded opportunities for its application.

Today the Norton Pulpstone is operating in grinders with a power input in excess of 3500 H. P. Its several abrasives, range of structures and variety of grit sizes make possible an infinite number of combinations. Thus from many kinds of wood it is producing the types of pulp required not only for newsprint but also for magazine paper, insulating board, molded paper products, hanging papers and countless others.

Yes, the paper industry was quick to take advantage of the new tool which Norton originated and introduced to it 24 years ago.



GROWING A NEW "CROP" OF TIMBER EVERY 80 YEARS



This harvesting and re-growing area at Vail, Washington, reflects the long range planning for successive tireber crops

THE WEYERHAEUSER forestry policy is based upon the growing, protecting and harvesting of trees...looking toward permanency and improved utilization of the forest crop. The photograph above illustrates this Weyerhaeuser principle of progressive harvesting and regrowing...a continuous cycle which will provide perpetual forest crops.

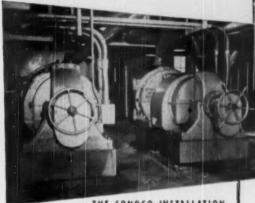
To grow a fir seedling into a tree of mature size requires from eighty to one hundred years. As a young tree progresses through the various

stages of growth, it must be protected from fire, disease and insects until it is ready for harvesting.

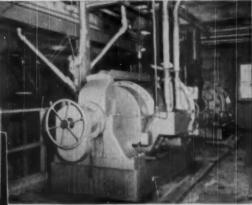
Weyerhaeuser alone and in cooperation with others in the forest industry, now operates eleven certified Tree Farms. These areas, under modern forest management, will continue to produce new crops of timber as generations come and go. The Weyerhaeuser Timber Company grows trees because it is good business... the cycle of harvesting and growing providing a permanent source of raw material for the Pulp Division.



Mills that compare Refiners



THE SONOCO INSTALLATION
Hartsville, S. C.
Showing Sprout-Waldron Refiners
for Semi-Chemical Pulping



choose

Sprout-Waldron

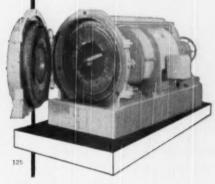
The many recent installations of Sprout-Waldron Refiners for semi-chemical pulping prove—that Sprout-Waldron Refiners are definitely preferred for this type of operation

But these rugged, precision engineered Refiners can do any kind of pulping — do it well and with great economy.

Their exclusive peripheral control ring feature provides great flexibility of adjustment, so that you can produce a wide variety of pulp characteristics. With the S/W Refiner you can pinpoint exact pulp requirements.

Initial investment is comparatively low, and inexpensive long-life plates are available in many styles. High production rates; economy in power consumption; ease of operation, adjustment, and maintenance give you other important advantages.

Our representative will be glad to explain how Sprout-Waldron Refiners can increase your output and save operating costs . . . or let us send you our Bulletin R-748. Address Sprout, Waldron & Co., Inc., 32. Waldron Street, Muncy, Penna.



S/W Refiners do a wide variety of

jobs - all of them thoroughly and

economically. Here are some applicacations refining kraft, sode, and sul-

phite knotter and fine screen rejects;

hogged bull screen rejects; knotter and second screen rejects of raw

groundwood; semi-chemical chips of all kinds; spent chips after extraction process; bagasse, straw, and similar

grasses; breaking down lumps in re-

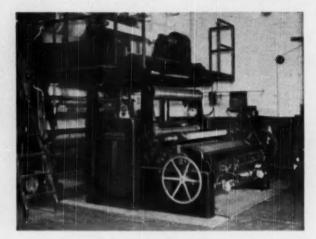
claimed waste paper stock; reduction and refining of reg and other half

1950 Review Number



High Speed WINDING

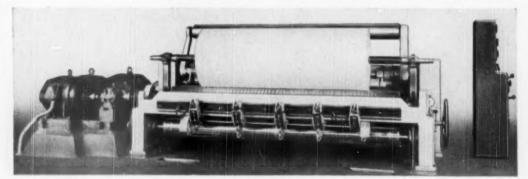
Clean Cut SLITTING



plus EASY OPERATION

APPLETON
WINDERS &
REWINDERS

Easily controlled by the operator, Appleton L Model Winders and Rewinders perform smoothly and quietly at speeds of 3500 feet a minute and faster. Operation is simple, accurate and flexible, with finger-tip control. On the rewinder, a pneumatically engaged coupling connects the parent roll shaft with the electric control motor. Longitudinal adjustments are made from the control panel, along with selective oscillation to level off ridges and markings. The paper is passed under the rewinder and around the platen roll, over the front drum to the raised core shaft which is then lowered into the valley between the drums. The hydraulically operated swinging-arm riding roll is let down onto the core shaft and the slack retrieved by the tension motor. The pneumatically operated slitters are lowered to engage the platen roll. Winding speeds, tension of the sheet and the density of the finished roll are now easily push-button controlled by the operator. With the winding operation completed, the hydraulically operated ejector comes up from the underside and moves the finished roll to unloading position. Here is easy, accurate winding for greater production of quality rolls, uniformly wound rolls with clean cut ends.



THE APPLETON MACHINE COMPANY . APPLETON . WISCONSIN

Eastern U. S. A. and Foreign Sales • CASTLE & OVERTON, Inc. • 630 Fifth Avenue, New York City



These pumps are particularly suited for pumping chlorinated liquors, acids and similar liquids. Note that all internal surfaces of casing exposed to liquid can be coated with

rubber, or any substance which can be vulcanized or bonded to cast iron. Impellers may be similarly coated, or of special alloys un-

coated.

Special features, Warren Type "A" Liquor Pumps:

- · ADJUSTING SCREW-maintain efficiency by adjusting for im-
- Extra Heavy Shapt—high factor of safety for severe services. Protective shaft sleeve provided.
- VERY STURDY PEDESTAL-dependable for heaviest service.
- · LARGE SUCTION OPENING AND IMPELLER EYE -- insurance against plugging.
- · LINING MECHANICALLY LOCKED AS WELL AS BONDED-dependable protection
- . DEEP, LIQUID SEALED, STUFFING BOX-reduces leakage and protects packing
- OPEN IMPELLERS WITH EDUCTOR VANES—accommendate solids or pulpy liquids without binding.

PUT YOUR LIQUOR HANDLING PROBLEMS UP TO WARREN!—Send for Bulletin 245 showing the complete line of Warren Liquor Pumps; also other bulletins covering pumps for all pulp and paper mill services.

ARREN

WARREN STEAM PUMP COMPANY, INC., WARREN, MASSACHUSETTS

1950 Review Number

PULP & PAPER

For better piping every time ... Check the complete CRANE line

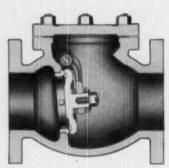
NEW DISC-HINGE CONNECTION GREATLY REDUCES WEAR

Note the improved spring loaded disc-hinge assembly on these Crane Iron Body Swing Check Valves. This patented semi-rigid connection eliminates lost motion, yet has the flexibility needed to assure true seating. Wear at the disc-hinge connection is practically eliminated.

Crane body design assures ample flow area. Disc always swings freely to give unrestricted flow; cannot stick in open position; closes securely when forward flow stops. Bolted cap construction, plus tapped and plugged body openings, provides easy access to all working parts.

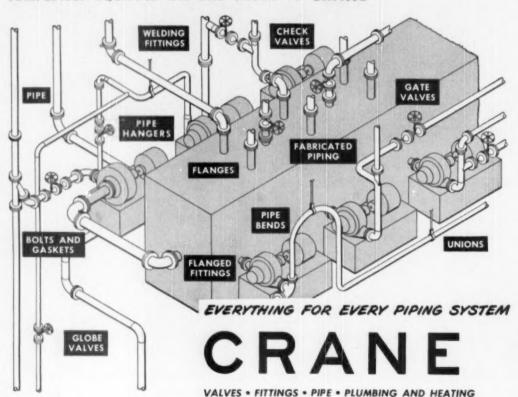
As with all Crane swing checks, these valves can be furnished with outside lever and adjustable weight when extreme sensitivity to flow reversal or to low inlet pressure is desired. Available with flanged, screwed, or hub ends. See your, No. 49 Crane Catalog, P. 120-121.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill. Branches and Wholesalers Serving All Industrial Areas



No. 373 brass trimmed check, sizes 2 to 8-inch. Alse available with leather disc or in all-iron. Sizes 10 to 24 inches have conventional disc-hinge connection. See Crane Catalog for Working Pressures.

PIPING TO SEAL CHEST IN A MULTI-STAGE BLEACH PLANT . . . COMPLETELY EQUIPPED ON ONE ORDER TO CRANE





G. T. Features For Easier, **Lower-Cost Slitting**

Gears Eliminated, resulting in greatly reduced upkeep and almost complete silence. V-belts replaceable without dismantling. Rotating members, except mill roll shaft, mounted on sealed anti-friction bearings.

Motor Drive sold as package, including M. G. set, Main motor and mill roll brake on right of machine. Kidder engineers will recommend motors of correct capacity.

Shear-Action Cutting severs web. Shaft-mounted, two-edged back cutters, 34" wide, are driven slightly faster than the web. Ball-bearing front cutters, rotating by pressure against back cutters, are kept sharp by latter's harder metal.

Slit Webs Are Wound either on core or on a collapsible shaft, in cradle formed by two drums, under pressure

C. P. ROBINSON

from a third above. The two drums are driven by main motor; top roll is driven by a rheostat-controlled auxiliary motor.

Hardness Controlled by varying pressure and speed of top roll assembly, which is heavy enough to wind the hardest roll. Pneumatic cylinder provides counterbalance ranging from zero to complete lift.

Web Tension is provided by watercooled, rotating-disc brake. Actual tension control is through pneumatic diaphragm exerting smooth, flexible pressure on the two stationary plates.

Bow Bar helps smooth out wrinkles and handle baggy stock. Bar, adjustable as to angle, can press on web's center or edges, combining with the mili roll's bias adjustment to keep web straight and taut.

Send for complete information on the quieter, smoother-working, cost-reducing Model G. T. Slitter



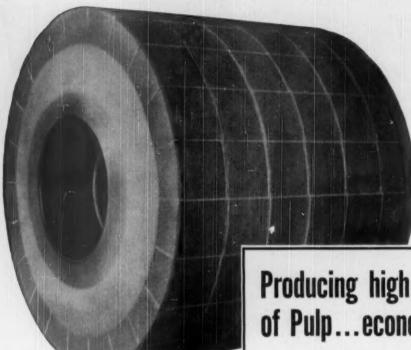
- Clean, Accurate
 Cutting
 High Speed, Dustless Operation
- 3. Easy Separation of Rolls

KIDDER PRESS COMPANY, INC.

DOVER, NEW HAMPSHIRE

MACHINERY SERVICE COMPANY

Graybar Bldg., New York 17, N. Y. P. O. Box 33, Los Angeles 11, California



PULP **STONES**

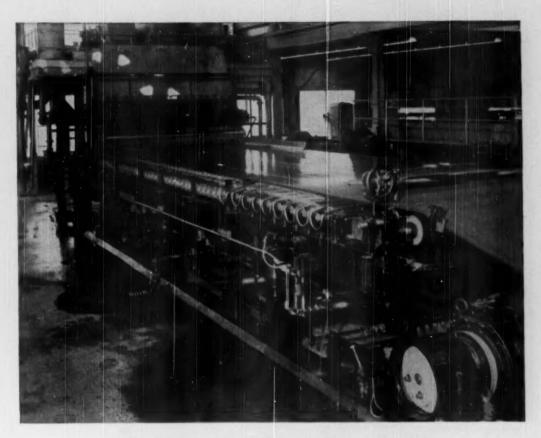
Producing high grades of Pulp...economically

Pulp Stones by CARBORUNDUM are available in various structures to meet your specific grinding conditions. Produced under scientific control, they offer safe continuous low cost operation.

These wheels operate on long burring cycles assuring fewer variations in pulp quality. They are strong, durable, and economical. The Carborundum Company, Niagara Falls, New York.



"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company.



A STAINLESS STEEL FOURDRINIER WITH BUILT-IN VERSATILITY

Few machines ever contained as many new designs or special features to meet exacting modern requirements as the new Downingtown Stainless Steel Cantilevered Fourdrinier now making .009 corrugating at the expanded and modernized mill of Sonoco Products Co., Hartsville, S. C. This Fourdrinier, with a wire 144 inches by 92 feet and speed range of 150 to 1500 FPM, is designed to produce 100 tons of .009 container board daily. There are nine stainless steel flat suction boxes, suction couch roll with double suction box opening, a stainless steel head box with five point stock inlet, several passes to even the flow, two stainless steel dis-

tributing rolls, a foam shower, and both high and low speed stainless steel slices. Plus these other exclusive Downingtown features—easy wire changing, new level adjustment while running, new type shake rails, modern multiple shake mechanism, balanced wire rolls, new motor-operated stretchers, new permanent piping, no connections to break when changing wire and new corrugated stainless steel save-alls. This is versatility and perfection in paper machine manufacture! And here's conclusive proof: The machine produced saleable paper on the first roll! For the best in Fourdrinier and board machines and auxiliaries, consult Downingtown.



DOWNINGTOWN MANUFACTURING COMPANY

DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY SINCE 1880

1950 Review Number

PULP & PAPER

43

How to beat a legal "threat" on WASTE DISPOSAL



... and cut fibre and chemical losses!

WITH STATE AFTER STATE now imposing legal restrictions on industrial waste disposal, you may be faced with this problem quite suddenly. Only by starting to gather complete data now can you be prepared for necessary action when that time comes. And the same data will reveal the extent of your fibre and chemical losses in plant waste. (The Foxboro waste-sampling system gives a continuous sample always in proportion to effluent rate—thereby assuring an accurate analysis.)

Foxboro has prepared a concise, informative bulletin on how to conduct a waste disposal survey. Based on specialized knowledge and long experience, this bulletin outlines the simple steps you can take to avoid hasty, last-minute plans. It shows how a careful, unhurried survey now can easily provide the facts on day-to-day quantities, concentrations, and constituents, so essential to efficient planning.

Send for a copy of "Waste Disposal Surveys". Write The Foxboro Company 254 Neponset Ave., Foxboro, Mass., U. S. A.

TYPICAL FOXBORO INSTRUMENTS THAT LEAD TO BETTER WASTE DISPOSAL



The Model 40... "The finest modern controller"... is the foundation of many outstanding Foxboro Waste Disposal Systems. It is used for the control of flow. pH. conductivity, temperature and other variables. Thousands are in use daily.



Foxbore Float and Cable Type Instruments are specifically designed for use on weirs and Parahall flumes. They read directly in flow.

FOXBORO

RECORDING CONTROLLING INDICATING



- 1 Make better paper possible at lower cost by Continuous Beating.
- 2 Permit higher speeds with improved quality by faster drainage.
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- 4 Reduce the hp/ton of paper producedwithout sacrifice of quality.

5 Give greater flexibility, because of the wide beating range of the Sutherland Continuous Beating Process . . .

FOR YOUR MILL

Ask us about Sutherland Continuous Beaters now in operation, and the engineering that follows them up.

SUTHERLAND REFINER Corporation

TRENTON, NEW JERSEY

Manufactured in the United States by Valley Iron Works Ce., Appleton, Wisconsin Sutherland Religion Ltd., Windson Hotel, Montreal, P. Q.

1950 Review Number

PULP & PAPER

45



SAVING the RICH TIMBER CROP of the GREAT NORTHWEST

Timber growers—scientific farmers all
—have adopted a modern, long-range
program for the development and conservation of
their valuable crop. And Pennsalt insecticides play
a vital part in this program.

For example, just last year private interests joined with federal and state control authorities in a large-scale attack on the spruce budworm—one of the most destructive insect enemies of our coniferous forests.

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This is typical of how Pennsalt applies its experience and knowledge to the task of protecting our forests. In addition to insecticides, Pennsalt also supplies effective herbicides to keep down undergrowth which blocks forest roads. And for years Pennsalt has manufactured caustic soda and liquid chlorine for the Northwest pulp and paper industry.

All these Pennsalt products are made in the Northwest . . . from Northwest raw materials . . . with Northwest power.

Other Pennsalt Products Bleaching Powder Potassium Chlorate
Anhydrous Ammonia Sadium Arsenite
Sadium Chlorate Sodium Hypochlorite
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chemicals



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MONEL cloth for dandy roll covers... longer lasting — easy to braze — rustproof

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Monel's extra hardness gives extra service life. And, there is no accelerated corrosion between Monel and the machine wire.

Monel has long been a preferred metal in most of the nation's leading board and paper mills . . . for head boxes, stock

INCO STREET

Monel...for minimum maintenance

lines, screens, doctor blades, save-alls, jordan bars, winding wire, rolls, suction boxes and covers.

For information on Monel dandy roll covers, write directly to Jos. J. Plank & Company, Appleton, Wisconsin.

And as a first step to cutting costs in your own plant . . . find out how Monel is solving corrosion and production problems in other mills. Fill in and mail the coupon for your copy of "How to Eliminate Unnecessary Shutdowns in Washers, Deckers, Save-alls, Thickeners, Filters."

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67 Wall Street, New York S, N. Y.

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Please send copies of "How to Eliminate Unnecessary Shutdowns in Washers, Dechers, Save-alls, Thickeners, Filters."

PP-4-50

1950 Review Number

PULP & PAPER

47

One of a Series

from Western Precipitation Corporation - pioneers of the commercial application of COTTRELS and now selling COTTRELL recovery equipment in all parts of the U.S.A. and foreign countries.

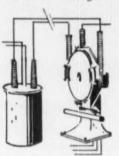
Various Methods of Energizing COTTRELLS Make Experience a Vital Factor

The many and varied factors affecting the operating efficiency of a COTTRELL Precipitator make experience and "know how" of the greatest importance in designing and installing COTTRELL equipment. Western Precipitation Corporation—the organization that pioneered the commercial application of COTTRELLS—has had over 39 years of first-hand experience in developing and perfecting the

various elements that make up a complete COTTRELL installation, and these years of experience assure maximum performance from every Western Precipitation COTTRELL installation.

For example, the equipment for energizing Western Precipitation COTTRELLS include such features as the following...







are of the Enclosed Cubicle type with flush-mounted meters, push buttons, selector switches, and indicating lights. The cabinet door and rectifier central circuit are interlocked. Rectifier and transformer contactors, instrument transformers, top switches, terminal blocks and other auxiliaries are mounted inside the switch-heard cablinet.

RAPPER AND POWER PANELS—are of the same external appearance as restifier switchboards and can be installed beside rectifier switchboard in the conform and continuous switchboard installation. The cabinet is divided into two compartments—one containing AB breakers for central of all individual rectifier and signal circuits—the other containing all rapper centrals and timers.

RECTIFIERS—for either full or half wave rectification. Mechanical rectifiers of the solid disc type are supplied with Radio Interference Correctors and Inductive Type Automatic Polarity devices. The Automatic Polarity devices has no commutator or brushes contacting high speed retating parts. High voltage switch gear with interlocking control units is available.

HIGH VOLTAGE CONNEC-TIONS—between the rectifiers and the COTTRELL may be either special high veltage petrolatumfilled lead and steel-covered cable with pothead terminal cannections, or of red-and-bus-duct construction.

Watch for the next in this series which outlines the various COTTRELL electrode systems available from Western Precipitation Corporation.



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Western Precipitation can design COTTRELLS to operate at any desired efficiency, for any capacity, to collect virtually any solid or liquid suspended in a gas, a whether hat or cold.

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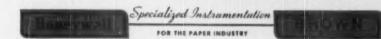
The Moist-O-Graph, the Area Flow Meter and Stock Transfer Values are typical of the special equipment designed and engineered for Paper Industry applications.

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BEFORE and AFTER

·· LODDING DOCTORS··

50

PULP & PAPER

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Available in 55-gallon drums. NOPCO 1497-8 -- for use as a defoamer in sating compositions which employ casein or other proteins as binder or adhesive. If

characteristics when used with starch, casein

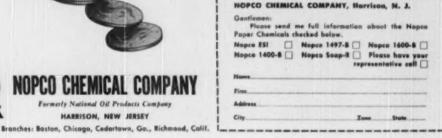
or other adhesives. Enhances brightness and gloss. Gives uniform smoothness to final coat-

ing. Reduces dusting on the supercalender.

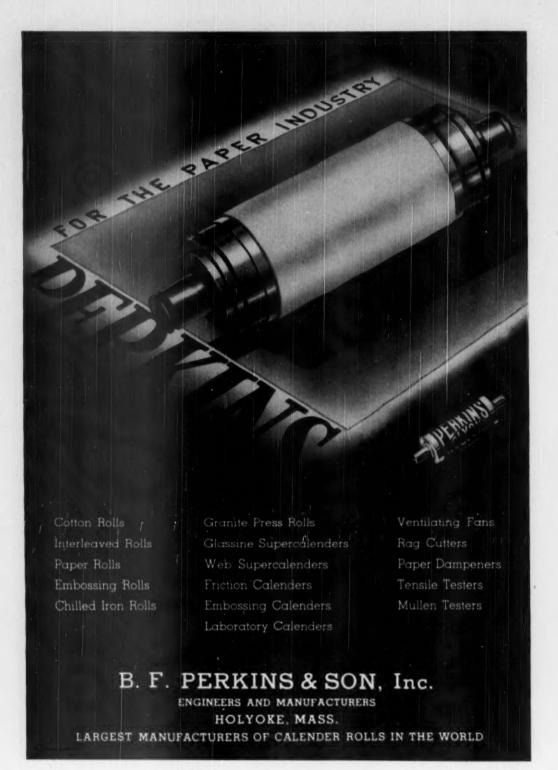
Improves fold-minimizes cracking and flaking.

the coating color. A high quality, low titre soap. Available in 80-lb. multiwall bags and 150-lb.

Full information about these products, and other Nopco paper chemicals for use in all phases of paper and paper board manufacture. Is yours for the asking. In addition, our Technical Service Department is ready at all times to help you solve your production problems. Profit by writing us today.



NOPCO CHEMICAL COMPANY





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Also, just 80 years ago, F. C. Huyck & Sons began the manufacture of fine quality papermakers' felts. Recognizing that every paper problem is a felt problem, this organization has pioneered in research and in service, working always in the closest cooperation with the paper industry.

In observing its 80th Anniversary, F. C. Huyck & Sons looks forward to a continuation of the policy it has so long pursued, seeking new and better ways to help the paper industry produce more and better paper—the product most used by man.

The dramatic story of paper is told in the sound-and-color film, "Paper — Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request.

F. C. HUYCK & SONS · Kenwood Mills · RENSSELAER, N. Y.



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PAPER MILL AND PAPER BAG MACHINERY

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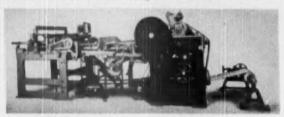


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MULTI-WALL TUBER

For the production of single and multi-wall valve notch tubes for sewed valve type bags. Machine built in 2 sizes, 20" and 26" face: tubes, 26" to 50" long.



ROTARY SPOT CUTTER

Rotary Cutters for accurately handling large quantities of stock in finishing room. When equipped with patented photo-electric compensator, will accurately spot-cut pre-printed traveling webs. Built in 40", 50", 60", 71" and 83" widths. Layboy and stacker may be furnished.



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Fully automatic electric eye, side register control or web feed. Manual control can be supplied.



NO. 10 TYPE TUBER

For pasted bottom, multi-wall tubes. Used in connection with S & W Bottomers or producing standard satchel bottom or valve bag. Fully automatic or manual control for web feed.

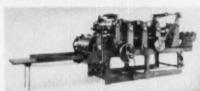
Complete information on any of the above equipment on request.

Modern, efficient machines for high-speed operation, large volume production and lower unit costs in the manufacture of paper and paper bags. Smith & Winchester equipment is custom-built to your specific requirements.



MODEL "E" UNDERCUT TRIMMER

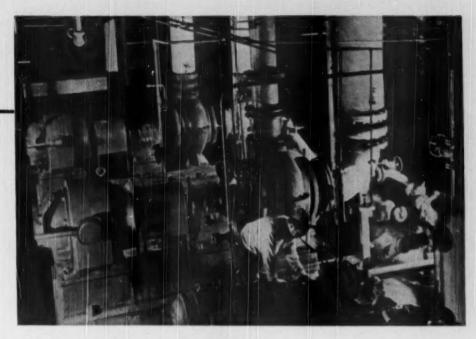
The S & W Undercut is the only undercut trimmer made. The Model "E" is newly designed for fast, effortless, accurate cutting and safe operation. Retains the outstanding features of the S & W Standard Undercut with many new features added for greater safety, accuracy and flexibility. Built in 56", 66", 76", 86" and 96" widths.



1/2 BBL BOTTOMER

S & W Bottomers are designed for high production and minimum spoilage with many new features for lowering bag production costs. Bottomers are made in several sizes. Produce standard satchel or narrow valve bottom.





For the Quality you want ...specify HOOKER CAUSTIC SODA

Is you find it necessary to clean your caustic storage tanks frequently because of sludge deposits, it's time to try Hooker Caustic Soda. Thanks to a recently improved purification process, Hooker Caustic Soda is remarkably free from those impurities that leave sludge deposits. Low in iron and sulfates, it is a high purity product—a purity that is uniform in shipment after shipment.

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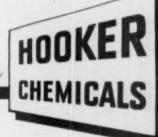
Hooker Caustic Soda is available in solid, flake, or liquid form. Liquid is supplied in 50%, 73% and special grade solutions.

For analyses and specifications on Hooker Caustic Soda, write on your business letterhead for technical data sheet No. 735.

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NEW YORK, N. Y. WILMINGTON, CALIF. TACOMA, WASH.



10-5

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White Caralina Ca.

Established 1846

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Canadian industries. Forecasts.	
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Next, come the six departments of	this
Review Number, which have been feat	ures

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Uses of purified pulps in rayon, cellophane, plastics, etc., as well as other uses of paper or pulp in laminates, molds, plastic products.

*Note-Each department includes, besides pe statistics, charts and other information, field-pre-pared commentaries by PULP & PAPER editors in each of five mojor productive areas at the industry in North America.

New equipment and processes developed durin the past year also are discussed in each of the

As broken down regionally in each departs ng to different industry practices and different authors the sections are concerned with:

> Northeast U. S. Middle West U. S. Southern States West Coast of U.S.-Canada Eastern Canada

ABOUT OUR COVER ILLUSTRATION

Selected for the cover illustration for this 23rd annual North American Review Number of PULP & PAPER is a fourcolor authentic reproduction of the interesting mural painting which graces the entrance of the new and modern Research Building of Marathon Corp., at Rothschild, Wis.

The mural depicts the stages of papermaking from the tree to the final product and it dramatizes the important role which scientific research has played in the growth of the pulp and paper industry to 5th place among all the industries of the United States and first place in Canada. For these reasons, it was selected for reproduction on the cover of this issue, as representative of its wide and comprehensive scope of contents.

To Dr. Allen Abrams, vice president in charge of research, Marathon Corp., goes credit for the commendable decision to have a mural painted in the entrance, rather than to put up a stereotyped photo montage or the usual commercial exhibit case. And he planned the mural in cooperation with the artist.

Mrs. Hazel Stoick Stoeckeler, of Rhine-

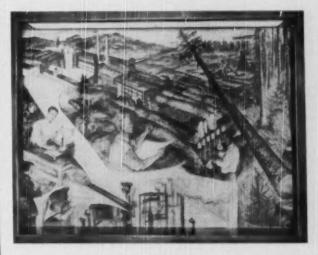
lander, Wis., mural painter and designer, formerly on the art faculty at the University of Minnesota, did the painting. She is the "Paul Bunyan" artist who did the 10x45 ft. mural, "Epic of Minnesota's Great Forests," in the University of Minnesota Forestry Building.

Mrs. Stoeckeler says Dr. Abrams gave her one admonition-he told her to avoid symbolizing the researcher with a beard, spectacles, white frock and a test tube clutched in hand over a bunsen burner! The artist did much preliminary work interviewing mill and research men, sketching and painting everything from a black spruce swamp to a paper machine, and consulting with George Gease, architect of the Research Building. An uncrackable wall and special plastering technique was required for the mural wall. Then came tracing of "the cartoon" (a full-scale pattern), its perforation, then "pouncing" with pulverized charcoal, to transfer outlines of design to the wall itself, and finally, painting in egg tempera-the same medium used by the Old Masters

What Is Shown in the Cover Picture

A black and white print of the color picture of the mural is shown at the right. It will be noted the mural is actually set back in a frame of black walnut paneling. An explanation of the figures and vignettes seen in the mural has been written for us by Mrs. Stoeckeler herself. It follower

"The scientist is the central figure-combining dual qualities of concentrated thought and action. He is framed



in swirling orbits of the carbon atom---the dynamic forces of energy whose secrets he probes. On the sheet in his hand is a formula of one of the materials whose chemical processing is a challenge to his scientific knowledge.

"On the right side of the mural is a forest under management for sustained yield.

"At upper left is the pulp and paper mill on the bank of a river which supplies water and hydro-electric power.

"Flanking the central research figure are laboratory technicians, two of them, and they work on paper-testing and problems in utilization of by-products.

"Another vignette at upper left shows a paper machine from which flows a huge roll of paper. A lift truck carries paper below the roll.

"At lower left the paper's moulding action around a loaf of bread suggests the research problems of packaging. The consumer—a woman shopper—reaches for one of the many products packaged in paper.

"In the lower center is the allied petroleum industry which produces the wax used extensively in moisture-proofing of

"Finally, to right of the refinery is the familiar and well known graph on 'Consumption of Paper and Paperboard compared with Population and National Income,' by Chairman Everest of Marathon, which was reproduced last year in the 1949 North American Review Number. This is used symbolically as a visual barometer showing progress and growth of the industry."

The Everest chart (on page 56, 1949 North American Review Number) showed the steady long-term rise since 1899 of U. S. Population, national income and consumption of paper and paperboard. Said Mr. Everest: "Careful analysis shows that over a period of 35 years the consumption of goods, which is the basis of all business, has been on the increase at least 85% of the time."

And to Clark E. Everest, Jr., son of the widely known board chairman of Marathon and long-time president of the company. Pulp & Paper is indebted for taking the excellent color photograph of the mural which was necessary in order to reproduce it on the cover of this magazine.

Marathon's Postwar Expansion

Marathon dedicated its new Research Building in Nov. 1949. Here in modern, commodious and well-equipped laboratories and offices are centered the development work for this far-flung pulp and paper enterprise. As many of our readers know. Marathon has pulp and paper mills at Menominee, Mich., and Ashland, Menasha and Rothschild, Wis., a converting plant at Wausau, Wis., and a 320-ton bleached kraft pulp mill at Marathon, Ont. This mill cooked its first pulp on Sept. 20, 1946, and in Jan. 1947, went into full bleached pulp production. Editors of this magazine made several visits to this mill for exclusive illustrated articles (full list of equipment and flow sheet, Sept.



HAZEL STOICK STOECKLER, Rhinelander, Wis., artist, is shown working on the mural for Marathon Corp.'s new Research Building at Rothschild, Wis. The mural, which depicts stages of papermaking from tree to final product and dramatizes the role of the research worker, is reproduced in color on the cover of this issue of PULP & PAPER. Mrs. Stoeckeler has traveled extensively studying mural painting in the U. S., Mexico and 11 European countries. She painted the "Epic of Minnesota's Great Forests" mural in the Forestry Building at the University of Minnesota. Her paintings are in private collections and she has exhibited at Minneapolis Institute of Art, Walker Art Center and Chicago Art Institute.

1945, issue; complete illustrated article on start-up, Jan. 1947 issue).

Here are Marathon's U. S. Mills and capacities in tons daily:

Rothschild, 180 in waxed and special papers; 130 in sulfite pulp; also plastic and chemical sulfite waste liquor byproducts, including vanillin.

Menominee, 185 in kraft and sulfite waxed and special papers.

Menasha, 35 in waxed sulfite papers. Ashland, 38 in tissue and waxed papers. Wausau, converting only.

At Menominee, purchased since the war, Marathon added a new Beloit tissue machine to one already there. At Menasha, a modern new carton plant was built. There were improvements in Rothschild and the other mills.

Marathon is a leading manufacturer of protective food packaging and it also markets bleached kraft pulp in such quantities as are not used in its own plants. We have also mentioned its sulfite liquor products including vanillin.

William L. Keady, former head of U. S. Gypsum, became president and general manager of Marathon in March, and D. Clark Everest retired from those positions but continues as chairman.

Vice presidents are John Stevens, Jr., who is also president of Marathon Paper Mills of Canada, Ltd.; Leo E. Croy, in charge of U. S. operations in pulp, paper, paperboard and converted products; Dr. Allen Abrams, in charge of research and the chemical division; Noel E. Keeler, in charge of finance and accounting; and Don A. Snyder, in charge of sales. Mr. Everest, Mr. Stevens, Mr. Keeler and Dr.

Abrams are in Rothschild; Messrs. Keady, Croy, Sund, and Snyder in Menasha, which in recent years has become a focal point for many of the company activities.

Resident managers of the U. S. mills are Roy Kelly at Rothschild; Don Rawson at Menominee; W. Graebner at Menasha; B. H. Metternich at Ashland. At Marathon, Ont., H. P. Klinestiver is vice president and woodlands manager; R. T. Steedman is resident manager, and Grant Ross, mill manager.

A General Review of the Canadian Industry

By almost every yardstick, 1949 was a banner year for Canada's pulp and paper industry. Curtailment of purchasing by traditional export markets injected a cloudy spot in an otherwise bright picture but, generally speaking, operators had little cause for anxiety or complaint.

Operations were close to the peak throughout the year, although there was a temporary recession in the pulp market in the spring, largely offset by a solid recovery in the fall. Newsprint output was about 200,000 tons more than ever before.

A reliable basic figure that indicates the kind of year it was is that for wood pulp production at Canadian mills, whether the pulp was sold as such, or manufactured into newsprint, paper-board, paper or other products. In 1949, the Canadian industry produced or used approximately 7.750,000 tons of wood pulp of all grades. That total was down from the phenomenally high levels of 1948 of 8,150,000 tons—a decline of slightly less than 5%. But the total for 1949 is almost exactly the same as in the previous record year of 1947 and it represented an increase of 62% over the highest pre-warmark.

It is the general opinion of leaders of the industry in Canada that never before have the pulp and paper mills, representing the nation's greatest breadwinner, the largest producer and exporter, been in a stronger position than today. But last year was marked by stabilization and consolidation after a somewhat hectic post-war expansion period induced by steadily mounting demand and restricted production facilities.

For the first time since the war, the output of pulp, newsprint and paper of all types and paperboard equalled the effective demand on the Canadian mills. In an effort to meet the greater post-war demand, the output of the Canadian pulp and paper mills was substantially increased in the last five years.

Due to devaluation and kindred economic developments, Canada's market for pulp and paper, particularly newsprint, slumped severely overseas and this would have been a more unfortunate loss had it not been accompanied by a continuing demand on this continent.

There is confidence among Canadian pulp and paper men that the overseas markets will eventually be reopened to them because these countries cannot very well do without Canada's output.

REVIEW OF FIFTY YEARS

AND THE NEXT HALF CENTURY?

Fifty years is a long time, even in an elephant's memory.

Great empires have risen and fallen in much less time.

Fifty years was considered a pretty good life-span back in an age when we knew less about disease and diets.

Fifty years is two "generations" and so, looking back over a half century of pulp and paper making, it is a good long look.

Since the dawn of the 20th century, pulpwood consumption in the U. S. has multiplied ten times—and today the out-look for perpetual yield and renewal of forests is at least that many times brighter!

The production of wood pulp has multiplied more than ten times. The production of all kinds of paper has multiplied more than nine times—of paper-board alone, more than 25 times. Paper imports have multiplied 700 times.

In this census year, we are astonished to find a population doubled in 50 years—but that is only twice as compared to the manifold increases of paper and pulp and wood production. Per capita consumption of paper has multiplied over five times. In newsprint alone, it has multiplied six times, even though the industry is comparatively a virtual dodo in this country. The copyrighted chart and data of the American Paper and Pulp Association on this page tell the story better than words.

The number of employes of the U. S. pulp and paper industry has quadrupled. Even as the Machine Age becomes more complex and push buttons continue to replace the brawn and muscle of many backs, or the fallible rule-of-thumb controls. Just think—four times as many jobs—and we submit this as proof everlasting that a minority of labor leaders, who have fought new machines in fear they were reducing jobs, were taking a narrow, short-sighted view. This does not refer to most labor leaders in the pulp and paper field, whose enlightened views are well known.

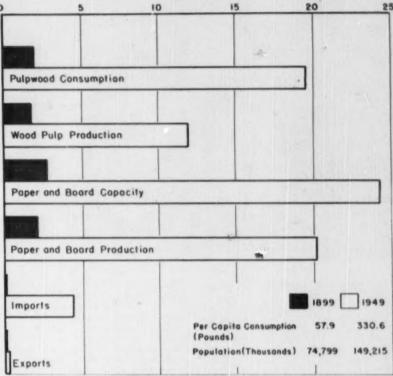
The number of mills in the U. S. today stands at about 900—just an increase of about 135 over 1900—but what a difference in the sizes and the multiplicity of processes!

In the Dominion of Canada, the number of pulp and paper mills increased about four times in the half century to 117 in the last recorded year, 1948.

The pulp and paper industry has become the No. 1 industry of Canada, serving the entire world with one of the most precious possessions of a free world, newsprint. The value of the Canadian industry's production has multiplied nearly

FIFTY YEARS OF FREE ENTERPRISE IN THE PAPER INDUSTRY

Millions of Cords / Tons



Copyright 1950, by American Paper and Pulp Association

Source U.S. Bureau of the Census

50-YEAR RECORD OF THE PULP AND PAPER INDUSTRY

Compiled and chartered as above by the American Paper and Pulp Association, is based on United States Bureau of Consustitutes. Here is the record:

	1899	1949	Increased
Pulpwood Consumption, Cords Wood Pulp Production, Tons Paper and Board, Tons	1,986,310 1,179,525	19,628,095 12,153,000	10 10+
Capacity Production Imports Exports Per capits consumption, lbs. Population Total U. S.	2,782,219 2,167,593 6,293 56,847 57,9 74,798,613	24,325,260 20,297,015 4,740,000 375,000 330,6 149,215,000	700 6 + 5 + 2

230 times. The number of its employes has multiplied 32 times.

In Mexico and Latin America the increases in respective categories are many, many times over a half century ago, and still growing. These nations have changed from the ancient papermaking ways of the Aztecs and Mayans—who, incidentally, are probably really the first papermakers of the world (and not the Chi-

nese as popularly supposed) to modernize industrial methods.

Looking Back 100 Years

While we are looking back 50 years, we might as well just take a quick look back 100 years. Most of the important inventions and process developments in modern pulp and papermaking occurred in the last half of the 19th century, setting the stage for the phenomenal indus-

WOOD CELLUILOSE - BASE FOR A HUNDRED DIFFERENT PRODUCTS

Products of INTERNATIONAL PAPER COMPANIES Include

on telesc 2 4 of and 5. Torquest

8. 2 high alpha pulp for planters and special seturology papers

Corrugated brefs contrainers 1. Nam. bolts and screws

Paper and issand for dollar res, rape and plates, waxing 9. Paper milk consum

16. Buscher wrogs 11. Papers for brompton, offers, paymen and histographic pricing

2. Paper for Sessions forms, earlier sing papers.

15. Tag stock Seturating pagers for plant steem, electrical insolution, ex-

15. Paper incloffyrsop sticks

20 for bigs



trial development of the first half of the

But for the development of the Fourdrinier, the machine which first made paper in a continuous web, we must go even farther back-back to about 1800 when the Englishmen, Henry and Sealy Fourdrinier and Bryan Donkin, actually created what a Frenchman named Robert had dreamed up.

But wood pulp-the greatest source of cellulose in the world, from the greatest reproducer of fiber in a given acre, the tree, acclaimed most beautiful product of Creation in a well known poem-was not used in paper until toward the end of the 19th century. Rags, straw, etc., were the sources of supply before the great possibilities in the fiber of trees was discovered.

So it has now been just 100 years since the first groundwood was made in Europe and 83 years since it was first made in Massachusetts and Quebec. Chemical pulping came in these stepsfirst soda pulp by Watt and Burgess in England in 1854; first sulfite pulp by Tilghman in Philadelphia in 1867 and the kraft process by the Swede, Dahl, in Danzig, in 1879. These were just discoverers of processes. It took years for them to be really developed.

In fact, the first actual sulfite mill was not built until 1874 in Bergvik, Sweden, and made 485 tons that year. It's still operating. That's something, when you consider only 300 out of 11/4 million companies in the U.S. can boast of even a 100-year history. It is interesting that early mill sites are often still the locations of successful mills. The first sulfite mill in America started up in 1885 at Merriton, Ont.; the first kraft mill in America in 1907 at East Angus, Que.

Both the Fourdrinier and cylinder paper machines were introduced in America in the early 19th century-a revolutionary step for this industry, changing it over radically from the methods first introduced in the American colonies by William Rittenhouse at Germantown, Pa., in 1690. They made water power an essential to papermaking.

But the real "revolution" has taken place in the last half century-the period primarily being reviewed in this article. This is the revolution which stems from the introduction of wood as a raw material. It started in the late 19th century but really went places after 1900. Papermaking became a major industry, a modern industry in every sense of the word, and, in reality, a chemical industry. Until the use of wood was introduced, paper mills were small and continually suffering from shortages of rags, manila stocks, etc., and these materials even had to be imported.

The "wood use revolution," really developing at the dawn of this century, caused these changes in the first 1900's: New York passed Massachusetts as leading papermaking state and still is the

leader in all grades. New York, Maine and Wisconsin-in that order-led in pulp. By 1939 Washington became first and still is; by 1947 Louisiana passed Maine to take second place. In the 1900's, Midwest wheat straw kept those states tops in paperboard, but wood use put New York ahead in ten years, and now Michigan, Ohio and Louisiana are leaders. in that order. Massachusetts kept its leadership in writing paper and book paper in 1900, but in the last decade Wisconsin pushed ahead in writing; Pennsylvania in book paper. New York led in wrapping paper at the century turn, was passed by Wisconsin after the first war. Now Southern states are leaders. New York led in newsprint in the 1900's but Maine and the Pacific Northwest states now lead.

50-Year-Old Paper Co.'s-or Older

It is interesting to note how many great paper companies of America date back through the entire span of the first half of the 20th century-and even farther. The years 1898 and 1899 seem to have been especially favorable for the inception of great paper companies. In the former year, International Paper Co. and Hammermill Paper Co. were formed. Last year was Oxford Paper Co.'s 50th anniversary. And St. Regis Paper Co. dates from 1899.

But Scott Paper Co. goes back even farther-to 1879. The predecessor companies of Crown Zellerbach are Columbia River Paper Co. at Camas in 1884; Willamette Pulp & Paper at Oregon City in 1888 and Crown Paper in San Francisco in 1889. Various mergers led up to Crown Willamette in 1914 and Crown Z in 1928. The still active chairman of the beard, Louis Bloch, went to work as a laborer with Crown Paper in San Francisco in 1893.

The biggest paper company in the world today, International, brought 20 New England mills together when it was formed in 1898. Its souvenir book, "After 50 Years" (published in 1948) recalls: "In the 1890's many paper mills had stood on the edge of disaster. Paper companies often led a prince and pauper existence."

IP grew from less than 400,000 tons annual production, virtually all newsprint, to over 3,000,000 varied tons in 1948—a little less in 1949. Canadian International Paper Co. was born and newsprint moved to Canada in a big way after 1913.

The great Southern kraft industry, now boasting 50 mills, including some of the largest in the world, gained its greatest impetus when the Southern Kraft division of IP was launched in 1925. In the next years many great mills were built in the South—the Southern pine came into its own as a really great tree—and eventually IP had eight big mills of its own. Now, 50 years after its inception, its expansion into the container field has been its most significant activity.

The development of hydroelectric power and newsprint hand in hand in Canada, the Southern kraft industry, the development of Middle West mills and the fantastically, almost inexplicable, growth of a great paper industry in Kalamazoo Valley—where there was no longer any wood, no water in great amounts, no other natural reasons—these are among the major events of this half century that has gone by. The best explanation of the famous riddle of Kalamazoo is simply that a number of papermakers like the Milhams and others just decided they wanted to make paper there.

But there is one more great development of the American industry-the development of a superior sulfite white paper and rayon pulp made from Western hemlock (which some leading scientists of this industry had said could never be done!). From the mill of the Old Rainier Pulp & Paper Co. (predecessor of Rayonier) at Shelton, Wash., where the late David B. Davies, a Wisconsinite, made the first pulp of this type back in 1927, while trying to keep the celebrating natives from tossing orange peels into the vats, this Western market pulp industry has grown to the point where it now supplies paper mills of the East with over one-fourth of their market pulp requirements-in fact probably close to onethird, when counting in British Columbia market pulp mills with those of Washington state.

This refers to worldwide and nationwide marketing of pulp-of course, pulp and paper manufacturing on the Pacific

BASIC PRODUCTION AND CONSUMPTION DATA ON U. S. INDUSTRY OVER A

			WOODPULF		PULPY	KOOD
Year	PA	PER			All Purposes (paper, rayon,	
	Production (tons)	Consumption (tons)	Production (tons)	Consumption For Paper Only (tons)		Consumption (cords)
1899 1904 1904 1904 1904 1901 1919 1919 19	6 190 361 1 7 334 614 5 336 317 614 5 336 317 6 29 482 6 10 602 070 11 140 235 6 381 840 9 186 260 11 377 690 11 776 2 365 17 683 862 17 685 863 17 182 804 17 370 965 21 114 600 21 921 757 667 21 114 600 21 921 757	2,158,000 3,049,824 4,224,000 6,479,100 7,866,827 6,053,915 10,590,000 11,915,233 13,347,925 11,185,686 11,456,046 11,500,032 11,456,046 11,500,032 11,915,233 11,456,046 11,500,032 11,915,233 11,456,046 11,500,032 11,915,233 11,456,046 11,500,032 11,915,233 11,500,032 11,915,233 11,500,032 11,915,233 11,500,032 11,915,233 11,915	1,179,525 1,921,798 2,498,522 2,498,522 2,598,522 2,598,522 2,598,672 2,875,692 2,875,692 2,875,692 2,875,692 2,875,692 2,875,692 2,875,692 2,875,692 2,875,692 2,875,692 2,875,692 2,975,	1, 216, 254 2, 091, 006 3, 485, 597 4, 565, 917 4, 566, 917 4, 596, 917 4, 596, 917 5, 590, 304 6, 704, 341 5, 966, 865 6, 704, 341 6, 905, 718 5, 966, 835 7, 977, 977 9, 781, 739 11, 365, 966 11, 018, 920 10, 635, 320 10, 635	11.072.204 11.352.412 12.603.004 13.402.431 15.044.504	1 986 310 3 030 717 4 001 607 4 470 763 5 477 832 6 114 072 4 557 179 6 033 831 7 643 011 6 750 659 6 715 916 6 706 659 6 715 916 6 926 649 17 204 600 16 409 600 16 409 600 17 41 001 17 41 001 18 41 001 19 41 001 19 41 001 10 41 00

Source: Bureau of the Census, U. S. Forest Service, A. P. & P. A., Bureau Foreign & Domestic Commerce, U. S. Pulp Producers Assn.

Coast goes much farther back. First paper made west of the Rockies was handmade in a Mormon mill in Salt Lake, which Brigham Young ordered constructed. Farther west, first paper was made on San Geronimo Creek, Marin County, Calif., in 1856. First groundwood was was made at Camas in 1886; first sulfite at West Linn, Ore., in 1891. That year we have already referred to so often-1899-saw the Floriston mill built, now a ruin in the scenic Donner Pass west of Reno, and that was California's only wood pulp mill until 50 years later, the recently completed Fibreboard kraft mill at East Antioch, started up.

Crown Zellerbach and St. Regis Paper Co. rank after International as the greatest paper companies, and it might depend on what basis you want to use for ranking as to which would be second and which third. We have recorded the red letter years in Crown Z's history.

As for St. Regis, it was first organized in 1899 and its first mill, at Deferiet, N.Y., was started up in 1901, employing 200. St. Regis has mills and timber holdings, divisions of all kinds, in all parts of the continent today. Its expansion in the Pacific Northwest and in the South were major events "50 years later." Today, its employment has multiplied 55 times—it has 11,000 employes. Just since 1945, it acquired new mills in New England, the Midwest and South, built a paper mill in the West and now has 23 mills and plants in the U. S., six in Canada and other countries.

There are other great companies of today that only date part way back in this half century, but their growth in recent years has been phenomenal. For instance, Kimberly-Clark dates back to just 1928; Union Bag back only to 1932, but Union Bag's experience in predecessor firms in making paper containers dates back nearly 100 years. In this brief report, we could go on into the long histories of many smaller, but nonetheless highranking companies, like the Crane Paper Co., Strathmore Paper Co., and many others. Many of them have shown no phenomenal growth, but instead have stressed the perpetuation of highest quality production rather than quantity.

What About the Next Fifty Years

And now—with some help from men in this industry in authority—we might peer a moment into the future.

Says George Olmsted, Jr., president of S. D. Warren Co. and 1950-1951 president of the American Paper and Pulp Association:

"This is the sixth largest in the national economy, with assets of five billions of dollars, with consumers spending over five and a half billions for our products, with over a half million workers, and with one of the highest investments per worker in the world.

"The industry has grown ten fold in the past 50 years—from a consumption of 2% million tons per year at the turn of the century to 25 million tons last year. Fortunately for us, it is an industry that is susceptible to still more growth in the future, for we are almost unique in having a besic raw material that can be reproduced over and over again like a crop.

"Perhaps the last half of this century will not bring as startling a growth as the first half —but there will still be substantial growth without question. I am optimistic for four reasons:

"The first two are what I call the 'mathematical reasons'; they are almost as certain as death and taxes. First, that as population increases the consumption of paper increases, and second, that as our civilization and culture improve the consumption of paper increases.

"A third reason for growth lies in the everincreasing research being done by this industry on new products and new uses for old products. Cellulose, you know, is among the least costly of all busic materials. There has never been a substitute for it; but it can substitute for many other materials.

"Last reason for my optimism over the long haul lies in the effort being made to reduce relative costs. If we can be smart enough to keep the prices of our products low (and still show a fair return on capital) then the public can afford to be lavish in its use of paper and paper products. This concept is, I think, essential to your well-being and ours."

HALF CENTURY-Continued

Another prediction is by George E. Williamson, president of Strathmore Paper Co., in which he quotes M. C. Dobrow, of the Writing Paper Manufacturers Association. Mr. Williamson, speaking before the National Paper Trade Association on March 28, 1950, in New York, said:

"Let us peuse for consideration to what has happened in the first half of the 28th Century insofar as fine paper manufacture and distribution are concerned. According to so good an authority as M. C. Dobrow, executive secretary of the Writing Paper Manufacturers Association, whom I quote: The production of writing paper in 1889 was approximately 113,000 tons. It is now roughly ten times that amount. In only ten of the last fifty years has production been less than in previous years, invariably in years of business adjustment or because of war-time controls. But as a dynamic industry it has always bounced buck, after such temporary setbacks, to new high records. This industry may not grow in the geometric proportions of the last fifty years, continues Mr. Dobrow, but it will grow as our oppulation increases, living standards are enhunced, and the volume of business transactions and intricacies of our civilization multiply."

"In prewar 1938 the population of the United States was approximately 130,000,000. Today the estimated population is 150,000,000, and in another decade it may reach 167,000,000. This industry can, I believe, look forwar'd to a greater consumption by an increasing number of consumers whose educational and living standards continue to rise. To bring about these beneficial results, however, will require selling efforts on the part of both mills and merchants surpassing to a considerable degree our past efforts."

Roy K. Ferguson, president and chairman of St. Regis, says: "The industry has worked out many maladjustments that followed the war... the underlying current for pulp and paper continues strong, as a result of new uses for paper, rising standards of living and a growing population."

Says Alexander Calder, president of Union Bag: "The steady trend of expan-

PRINCIPAL INFORMATION About United States Industry

Our information indicates these totals for the number of companies and mills in the U.S., compiled with analyzing of the American Paper.

				-M	illa
1946 1947 1948			517 560 570	Paper 723 735 758 768 764	Pulp 249 242 241 245 255
Year	No. of Opera- tions	Wage Earn- ers	Wages Paid	1	ndustry Worth
1849	443	6,785	\$1,497,792	51	7.260.864
1859	555	10.911	2,767,212		1,052,683
1869	677	18,021	7,208,691	34	556,014
1879	742	25,631	8.970.133		1,139,652
1889	649	31.050	13,204,828	81	8,829,546
1899	763	49,646	20,746,426		7,307,713
1909	777	75.978	40,804,502		0,348,505
1919	729	113.759	135,690,642	90	5,794,583
1929	883	178,049	173,077,781	1.25	0.000,000
1933	781	107,298	99,194,024		(Liava zo
1939	832	137,445	175,687,842	1.70	0.000,000
1940	854	146,300	195,000,000	1.77	0.000,000
1941	891	157.800	343,000,000		0.000,000
1942	897	157,700	274,000.000	1.92	0.000,000
1943	900	130,000	299,000,000		0.000,000
1984	890	146,400	315,000,000		0.000,000
1945	874	145,500	333,000,000		0.000.000
1946	837	167,000	386,000,000		0.000,000
1947	899	195,000	530,000,000		0.000,000
1948	111	205,000	613,000,000		0,000,000
		nerican Pa		Associat	ion; U. S.
Lebo	or Biatiot	ica; Census	he .		

UNITED STATES PULP AND PAPER INDUSTRY STATISTICS

	In B	Ilions of De	ollers	In M	illions	No. Employee	For Resolute	Fee Ton	Production Per Man Hr.
	Annessa	Not sent to	- Company		or miles	2111111111111			Management of the
1000	49.94	81 70	45 45	E40	6176	138	66	\$13.0	100.0
1900	32.30	81.70	81.45	945	295	146	99	12.4	101 9
1940	2.40	1.77	2.72	241	246	161	311	13.6	104.6
1941	2.01	1.00	2.30	241	284	164	104	16.6	101.9
1992	2.00	1.92	2.46	265	200	100	106	18 8	96.3
1943	2.76	1.99	2.59	254	3.29	200	100	10.7	97 2
1944	2.81	2.05	2.77	281	389	158	100	20.2	90 1
1945	2.97	2.13	2.88	214	352	159	100	20.2	104.6
1946	3.28	2.42	3.55	257	455	184	105	22.4	100.0
1947	4.03	2.87	4.77	355	5.50	195	108	25.2	109.3
1946	4.73	3.37	5.43	346	612	205	108	27.7	112.3
Eati	mated for	1948, last w	nor for wh	sich data is	available.				
Sourc	e: Americ	an Paper an	d Pulp As	Mm. except	labor data	which is by U.	S. Bureau of L	abor Statis	tics,

PRINCIPAL STATISTICS OF CANADIAN PULP AND PAPER INDUSTRY

Year	Establish- mentu	Capital	Em- ployees	Saluties and Wages	Fuel and electricity used	Materials and supplies used	Gross Value of products
1919 1921 1923 1925 1925 1927 1929 1931 1935 1937 1939 1941 1943 1945 1947 1948 1949	100 110 114 114 108 103 95 95 96 100 106 109 115 117	275, 767, 364 379, 812, 791, 417, 611, 679, 469, 387, 773, 564, 773, 806, 539, 767, 773, 806, 559, 265, 544, 773, 806, 579, 352, 287, 570, 370, 370, 570, 370, 370, 570, 370, 370, 570, 37	760, 26, 647 24, 619 29, 234 28, 031 32, 876 34, 202 26, 669 24, 037 27, 836 33, 205 31, 016 33, 020 39, 996 49, 946 51, 924	\$2,244,208 34,199,099 38,382,845 25,674,293 50,674,293 34,792,013 36,687,542 35,883,313 48,737,795 63,677,818 71,199,422 80,462,644 129,477,995 131,662,761	\$ 12,540,197 14,961,741 18,421,804 17,506,735 14,024,319 12,385,090 22,927,919 29,121,065 25,873,873,123,55,442,396 41,365,665 1,000,000	\$4,084,801 62,276,224 71,322,732 76,514,990 84,813,060 96,874,749 47,632,521 57,995,037 91,121,629 79,933,657 125,437,012 143,956,462 179,369,469 295,444,332 274,553,761 291,000,000	\$137,912,502 151,003,165 184,821,511 193,092,937 219,329,753 243,970,761 174,733,954 123,415,492 159,325,546 226,244,711 208,152,295 334,726,173 398,804,513 706,971,682 825,837,664
Ketiz	nated.						

sion in the market uses for kraft paper and paperboard products is continuing."

And in Canada, R. M. Fowler, continuing this year in his capacity as president

CANADIAN MILLS

No.	of Mills 1948
Groundwood pulp	66
Mechanical screenings	26
Boda pulp	1
Bleached sulfite (dissolving)	0
Bleached sulfite (paper pulp)	13
Unbleached sulfite (strong)	10
Unbleached sulfite (news grade)	46
Sulfate pulp, bleached	3
Sulfate pulp, semi-bleached Sulfate pulp, unbleached	12
Chemical screenings	35
Defibrated and exploded pulps	7
Other pulp	2
Newsprint	40
Groundwood and specialty papers	10
Book Paper	14
Fine papers	25
Tiesue paper	11
Senitary paper	14
Special industrial papers	10
Wrapping papers	20
Building papers	14
Paperboard Building boards	
Note: Most mills make two or more product are in all 117 mills.	a. There
Source: Dominion Bureau of Statistics.	

MILL LOCATIONS

	Pulp Mills	Pulp # Paper Mills	Paper Mills	Total
Nova Scotia	2	2	1.0	4
New Brunswick	3	3	-4	6
Quebec	11	32	7	50
Ontario	9	18	19	40
Manitolia	75	2		2
British Columbia	4	5		9
Canada	29	62	26	117
Note: There are th	cee mill	in Newfo	bredland.	

Source: Dominion Bureau of Statistics

CANADA INDUSTRY GROWTH

	Paper and Paper Mill	. Employe	Production
1871	21	760	\$ 1.071.651
1881	41	1,588	2.509,993
1891	5.8	2.817	3.633.257
1981	5.3	6,236	8.627,337
1811	72	9.766	23,226,479
1921	100	24,619	151,003,165
1931	103	26.669	174 733 954
1941	106	37,154	334 726 175
1948	117	51,924	825,857,664
1949*	318	\$1,500	830,000,000
* Estimated by	PULP & P	APER.	
Source: Domi	nion Bure	au of Statis	tico

and administrator of the Canadian Pulp and Paper Association, has continually admonished his associates to look at "the basic soundness of the continent's economic health and vigor and not merely your own fever charts."

Forecast for U. S. in 1955: 7,000,000 More Tons of Paper

John A. Guthrie, professor of economics, Washington State College, in his book "The Economics of Pulp & Paper," published by the State College Press, projects forecasts of pulp and paper consumption in the U.S. for the year 1955. He predicts total consumption of 31,700,000 tons compared with 24,681,000 in 1949 and 409 lbs. per capita compared with 331 in 1949.

He does this on the basis of past trends of population and per capita consumption increases, and points out that this was done in 1931 by Charles W. Boyce in this same manner, and that Mr. Boyce, who was then secretary of the American Paper and Pulp Association, was less than 5% off in his 1940 forecast. Then a war upset his calculations. Prof. Guthrie stresses that his projections depend on expected population growth; no radical change in consumer appeal; no revolutionary process change or change in raw materials; no war or other catastrophe:

ESTIMATED U. S. CONSUMPTION OF PAPER IN 1955

(See Paper Section for data up to

pı	resent year)	
	Total-Tons	Per Capita
Newsprint	5,600,000	72 lbs.
Book	2,700,000	35 lbs.
Fine	1,350,000	17 lbs.
Wrap and Bag	3,700,000	48 lbs.
Tissue	1,550,000	20 lbs.
Board	13,500,000	175 lbs.
All other	3,300,000	42 lbs.
TOTAL	31,700,000	409 lbs.

WORLDWIDE INDUSTRY STATUS

ECA Developments and Tariff Reduction

Worldwide status of the pulp and paper industry is becoming of greatly increasing importance to the North American industry. Pressure being brought by the United States government to increase the purchases of paper abroad; the drastic reduction in paper tariffs; and the millions being spent in the pulp and paper field by the Economic Cooperation Administration; and the sharp influence of devalued currencies on shifting pulp and paper markets—these are some of the major factors in play in 1950.

Canada, of course, has always been a world factor in the newsprint industry and the foreign commerce of North American market pulp mills has been significant, though not always large. Australia and Britain have in the past depended to a great extent on Canada—devaluation is changing the picture, perhaps temporarily—and Latin American paper companies, in many cases, look to North American pulp mills for small but critical supply.

Unfortunately there is in the chaotic world of today, with its iron curtains, no reliable data of worldwide scope on production, consumption and trade in pulp-wood, pulp and paper. Besides the complete blackout of Russia and satellites, there are also the varied standards and practices of compiling statistics in different nations that add to the confusion.

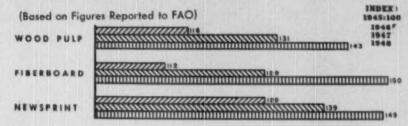
As this issue went to press new tariff reductions on paper were being discussed in Washington. In 1949, the Annecy, France, Reciprocal Trade agreement negotiations already had cut some paper tariffs sharply. Here are Annecy reductions:

Grade	Duty Rate Reduction	Negoti- ating Nation
Insulating Board Wallboard Beer Mat Board,	Prom 10 % to 5 % Prom 10 % to 5 %	Bweden Sweden
Plain	From 10% to 714% From 10% to 5%	Finland Sweden
Other Paperboard, Plain	From 10% to 714% From 3c per lb. and	Finland
Greeneproof,n.s.p.f.	15% to 1 %c. per lb. and 7 % % From 3c. per lb. and	Finland
	15 % to 1 1/4c, per	Sweden
Reinforced Paper	From Sc. per lb. and 17% to 2 c. per lb. and 10%	Italy
Kraft Wrapping Sulphite Wrapping. Other Wrapping	From 25 % to 10 % From 25 % to 20 % From 25 % to 12 %	Finland Sweden Finland
Manufactures of Paper	From 35 % to 17 %%	Sweden

ECA and Pulp and Paper

Cumulative authorizations by the ECA for wood pulp and paper amounted to \$95,800,000 as of March 31, 1950. On April 8, an ECA publicity release issued in Washington stated:

"A significant trend toward recovery of the Western European pulp and paper industry is indicated by the decreasing authorizations made by the Economic CoTRENDS IN WORLD PRODUCTION OF SELECTED PRODUCTS



operation Administration for purchase of these commodities outside the Marshall Plan countries.

"During the first year of ECA operations, total pulp and paper purchase approvals amounted to more than \$68,000,-000. During the second year, these authorizations totaled less than \$30,000,000. It is estimated that total approvals for pulp and paper purchases will be no greater than \$20,000,000 during the third year of the Marshall Plan.

"As European production facilities improve, and as the Marshall Plan countries are able to increase their own dollar earnings by increased sales of their goods in the United States, ECA dollar authorizations for purchase of pulp and paper will decrease gradually and will end in June of 1952.

"Before the war, Europe not only was self-sufficient in pulp and paper, but also did a tremendous export business in both pulp and finished paper with the rest of the world.

"As the Marshall Plan reaches the halfway mark, increased emphasis is being placed on switching allocations in the pulp and paper field from purchase of raw materials to allocations for purchase of capital goods. This ties in with the over-all efforts of Marshall Plan countries to increase productivity, iraprove efficiency, and reduce costs in the industrial plants of Western Europe.

"ECA officials expect that there will be increased requests for pulp and paper mill machinery as the European plants get their long-delayed modernization programs under way. ECA will approve projects which fit into an integrated economy of all of Western Europe. It does not plan to finance equipment for any plant which must depend upon protective tariffs and trade restrictions for its survival.

"The pulp and paper inclustry is the leading industry in several of the Marshall Plan countries and occupies a key position in all. Although the industry has no tremendous plants such as the steel and petroleum industries, for example, it includes hundreds of small mills which

have a far-reaching effect upon the economies of their countries. In some of the countries it is the leading export industry and its products play an important role in intra-European trade. Wood pulp is one of the biggest dollar earners among Europe's exports.

"In all of Western Europe, the industry is capable of turning out about six million tons of pulp and eight million tons of paper and cardboard, with a total value of \$2 billion annually. The industry employs more than 400,000 workers. It has been estimated that if the entire physical plant were to be replaced at current prices, it would cost more than \$3 billion. Merely helping this plant in its present state would require an annual investment of \$80 million.

"Very little new pulp and paper equipment has been installed in Western Europe in the last ten years even though much equipment was destroyed during the war and a great proportion of the mills were obsolete in comparison to our standards in 1939. There is a need for investment capital beyond the \$80 million annually which is necessary for mere normal replacements.

"The investment program for 1948 was only \$37 million, including about \$2 million worth of equipment purchased with ECA financing in the United States. During the fiscal year 1949-50, the total investment program is expected to reach about \$75 million of which \$12 million will be spent in the United States.

"ECA does not have complete information on the investment program for 1950-51. Indications are, however, that it will be greater than the present rate and may show a realistic relationship to the need.

"ECA officials said that during the first two years of the Marshall Plan, the greatest contribution made to the pulp and paper industry was in furnishing needed raw materials from the Western Hemisphere. Since April, 1948, ECA has authorized \$92,652,000 for the purchase of pulp and paper in the United States and Canada.

"This was spent as follows:

WORLD—Continued

\$40,282,000, or 42.1%, for wood pulp for paper.

\$23,817,000, or 24.9%, for dissolving pulp.

\$20,412,000, or 21.3% for newsprint. \$11,077,000, or 11.5%, for other paper

and paperboard consisting mainly of specialty papers not available in Europe

"Thus, about 67% of the total was for pulp and the remainder was for grades of paper which were in short supply or not available in Europe at the time

"At the present time annual consumption of paper in Europe varies greatly from country to country, being as low as five pounds per capita in Greece and as high as 155 pounds per capita in Sweden. The average for Europe is 56 pounds per capita. This is in contrast to 360 pounds per capita in the United States.

"Total consumption of paper and paperboard in the U.S. increased 94% between 1938 and 1948, whereas the consumption in Europe is still below prewar levels. The Marshall Plan countries hope to raise consumption from 56 pounds per capita per year to 66 pounds by 1952. This small increase of 10 pounds each for 270 million people would require an increase of 1,350,000 tons.

"In view of this anticipated increase in consumption, ECA officials predicted that exports to the U.S. could not be greatly

PER CAPITA CONSUMPTION OF WOOD PULP AND WOOD **PULP PRODUCTS**

(Based on reports from selected countries to Food and Agriculture Organization of the United Nations. Continental and World Estimates made by FAO. Laiest available.)

	Estimated Population (1948)	Tons Con- sumed Per 1,000 Persons (1948)
World Total		23
Europe		21
Austria	6,950,000	26
Elegistra.	B . 560 . 000	30
Denmark	4.190.000	3.7
Finland	3.960.000	87
Ireland	3,000,000	15
Italy.	45.700.000	7
Pictherlands	9.790.000	2.2
Norway	3.180.000	7.5
Sweden	6.880.000	82
United Kingdom	50,000,000	27
Near East-North Africa		2
Egypt	19.300.000	3
Turkey	19,500,000	2
North America		117
Canada	12.900.000	84
United States	147,000,000	120
Latin America		4
Chile	5.620.000	10
Colombia	10.800.000	2
Peru	7.230.000	3
Uruguay	2,300,000	13
Venezuela	4,500,000	8
South and East Asia		1
Burma	17,300,000	*
Ceylon	7,100,000	E
India.	342,000,000	
Japan	80,700,000	8
Oceania		43
Austrelia.	7.710.000	43
	1,840,000	46

expanded. They pointed out that additional sources of fibrous raw materials must be found and exploited, and investment capital must be raised if the low rate of paper consumption in Europe is to be increased. They report tremendous opportunities for investment in the pulp and paper industry throughout Western

A proposal that large-scale production of specific paper products be centralized in different countries of Western Europe was made by members of a Marshall Plan nations' productivity team, which made a nine-week study of the American pulp and paper industry in 1950.

The trip was sponsored by the ECA and the Organization for European Economic Cooperation The group, numbering thirty-four, was the largest inter-European productivity team to visit this country on a Marshall Plan study.

The main lesson learned by the group, said Gilbert von Giannelia of Austria, secretary of O. E. E. C. paper and pulp committee, was the effectiveness of ma production methods.

He also stated that Europe cannot hope to compete with American paper companies, except on the small scale especially high quality papers. Also, Europe must stop putting too great emphasis on quality in paper beyond what is essential to its purpose, and must begin to draw on hardwood and waste-paper supplies in pulp and paper making.

Paper From Bagasse

A contract has been signed between Refina-dora Paulista S. A., Sao Paulo, Brazil, and dora Paulista S. A., Sao Pitulo, Brazil, and Celdecor Africa (Pty), Ltd., Benoni, Union of South Africa, by which the latter firm will design and erect a bagasse pulp and paper mill in the state of Sao Paulo, to produce 5,000 tons per year of writing and printing papers by the Celdecor-Pomilio process. An electrolytic plant will be built to make caustic soda and chlorine. Layout will follow continuous lines applied in the mill recently started up in Algeria, North Africa, for the production of fine tapers from estuario grass. papers from esparto grass.

Production is to start in March, 1952.

WORLD PAPER AND FIBERBOARD PRODUCTION

(Reports from selected nations to Food and Agric. Organization of United Nations and Estimates by FAO for continental and world totals, including non-reporting nations. Figures are in thousands of metric tons.)

	Newsprint			aper and board	Fiberboards	
	1947	1948	1947	1948	1947	1948
World Total	6.700	7.130	25.030	26.660	1,680	1.880
Europe	1.360	1.570	4.940	5.450	520	500
Austria	38	64	104	171	12	13
Belgium	45	44	192	203	11	18
Czechoslovakia	28		201		72	
Finland	290	320	228	240	27	42
France	184	2.1.5	714	111	6	
Germany: Bizone	51	73	318	568	15	27
Italy	36		321	11.5	18	27
Netherlands	35	70	*176	*214	6	3
Norway	115	145	320	330	36	39
Sweden	280	299	785	788	235	256
United Kingdom	262	303	1.472	1.589	**29	**34
Near East-North Africa	5	10	20	20		-
North America	5.190	5.370	19.430	20.380	1.120	1.320
Canada	4.059	4.209	4.035	1,166	145	169
Newfoundland	379	1100				
United States	756	786	18.399	19.217	973	1.155
Latin America	20	40	190	210	10.00	
Brazil	18	31	152	***156		
Chile	5	100	31	40	-	
Peru	111		10	11		111
South and East Asia	90	100	290	430	10	20
India			95	99		
Japan	90	101	197	327	90	18
Oceania	30	30	160	170	30	40
Australia	30	31	152	157	20	23
New Zealand	-		11	111	10	13

^{*}In addition, the production of straw paper and strawboard was 173,000 tons in 1948, and 210,000 tons in 1947.
**Includes laminated board.

WORLD WOOD PULP SUMMARY (In Thousands of tons of 2000 pounds)

	I.	948			1949		
Total Chemical	Production 18,879	Consumption 18.393	Capacity 22.776	Production 18.432	Consumption 17,508	Imports 3,995	Exports 4,092
North America Latin America Europe	12,962 89 5,546	13,224 284 4,519	14.793 116 7.418	12,223 99 5,774	12,415 349 4,294	1,428 229 2,229	1,432 0 2,660
North only South Africa Asia & Pacific	4,142 17 265	1,402 18 348	5,279 17 432	4,130 17 319	1,243 18 432	14 1 108	2,550 0 0
Total Mechanical North America Latin America Europe	10 . 457 6 . 920 136 3 . 092	6.950 136 2.945	8.009 153 4.674	10.464 6.637 142 3.327	10 .249 6 .647 142 3 .099	863 190 1 672	903 188 0 715
North only South Africa Asia & Pacific	1.856 0 309	1.215 310	2 824 0 512	1,970 0 358	1,266	0 3	714 0 0
GRAND TOTAL Source: U. S. Pulp	29.336 Producers Ass	28,734 n. and Canadian	36 124 Pulp & Pa	28 896 per Assp.	27.757	4_858	4,995

^{***}Does not include paperboard.

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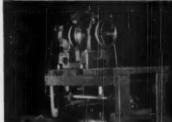
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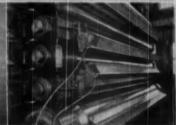
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VICKERY FELT CONDITIONERS - for



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SOUTH WALPOLE . MASSACHUSETTS

1950 Review Number

PULP & PAPER

65

THE PAPER SECTION

MARKET IS BEING SUSTAINED

The year 1950 looked generally strong for the North American paper industry with prospect of more stable operating conditions and a favorable earnings record. V. Le-Roy Neubrech, chief of the pulp and paper section, Forest Products division of the Office of Domestic Commerce in Washington, reported as of April 27, 1950, that: "The market for paper is being sustained by the generally much stronger national consumer demand for most goods and services which for the first quarter of 1950 and extending into April was at a higher level than even the very satisfactory fourth quarter of 1949."

Guarded optimism had been reflected from most 1950 predictions by paper industry leaders and as mid-year approached this feeling still seemed dominant. Inventories were generally back to normal, a point of strength.

Canada, now with Newfoundland a tenth province, Mexico and other North American nations, made at least 27,000,000 tons of paper in 1949. This was under 1948 slightly—perhaps 1,250,000 tons—but compared with under 20,000,000 back in 1940, and under 18,-000,000 in 1930.

The year 1949 recorded the third largest annual production of paper in the United States and the largest in history in Canada. In other sections of this NORTH AMERICAN RE-VIEW NUMBER we treat in more detail with two important segments—newsprint and paperboard, the latter being considered along the growing fiberboard industries in a separate chapter.

The American Paper & Pulp Association placed U. S. paper and board production at 20,304,243 tons in 1949, about 1,600,000 tons under 1948, and under 1947 by 800,000. But this was still a whopping production compared to pre-war years and more than twice the production of the middle 1930's and earlier.

Pulp & Paper's estimate of Canada's total paper production in 1949 is 6,450,000 tons, and of this, only 1,500,000 was in papers other than newsprint. Still, these were records for the Dominion. In 1948, it was 6,063,646 tons; in 1947, 5,775,082; in 1943, only 3,882,262, but in 1941, 4,449,598.

Consumption of paper per capita in the U. S. has climbed to 330.8 lbs., higher than any year before 1947, but dropped off from 356.2 in 1948 and 343.8 in 1947.

The Neubrech April report makes this interesting point:

"Another element of strength, to which the paper and board industry has contributed to some extent, has been the unexpected maintenance of capital expenditures for plant and equipment. Since January orders for such items have increased and the backlog of unfilled orders is reported higher than at year end. It has been estimated that on a seasonally adjusted basis, total expenditures for plant and equipment for the first half of 1950 will be about the same as in the last half of 1949."

U. S. PAPER PRODUCTION, IMPORTS, EXPORTS, AND CONSUMPTION (All Grades—in tons of 2,000 lbs.)

				Consun	nption	
Year Production	Production Imports**		Exports**	Tons	Lba/Capita	
1899	2.167.593			2.167.593	57.9	
1904	3.106.696		77,704	3.028.992	73.3	
1909	4,121,495	55,962	74,764	4,102,693	90.5	
1914	5,152,705	349,278	106,713	5.395,270	110.2	
1919	5,966,076	707,548	420,540	6.253.084	119.1	
1924	7.929.985	1.500.433	149,541	9.280.877	164.0	
1929	11,140,235	2.533.603	262,383	. 13.411.455	220.3	
1934		2.265.284	163 . 199	11,288,680	178.6	
1937	12.837.003	3.412.409	221.419	16.027.993	248 8	
1939	13,509,642	2.687.484	248,569	15.948.557	243.7	
1940	14.483.709	2.826.880	553,284	16.757.305	254.5	
1941	17.762.365	3.123.490	464,389	20.421.466	306.6	
1942		3.038.499	341,920	19,780,441	293.8	
1943	17,035,688	2.720.906	319.922	19,436,672	284.8	
1944	17,182,804	3.576.277	313,917	19,445,164	281 6	
1945	17,370,965	2,753,211	458,689	19,665,487	281.7	
1946	19,277,667	3,625,422	393,301	22,509,788	318.8	
1947	21,114,000	4.120.917	474.094	24.760.823	343.8	
1948	21,921,757	4.581.442	397,024	26,106,175	356.2	
1949(1)	20,304,243	4.748.981	372,357	24,680,867	330.8	

(1) Preliminary.

°° Quantities estimated, wholly or in part, from values given. Imports and exports for various grades include 'Paper Products.'

I Estimated by the American Paper and Pulp Association.

Source: Bureau of the Census for Production and Department of Foreign and Domestic Commerce for Imports and Exports, and the American Paper and Pulp Association.

TWELVE LEADING STATES IN PAPER PRODUCTION

PULF & PAPER has often been asked: What states lead in paper and paperboard production in the U. S.?

In this section are some interesting statistics—1947 is the last year for which they are avail-

New York is shown as the No. 1 state with about 1,850,000 torus. Here are the "Big Twelve":

	State	Tons
1.	NEW YORK	1,850,000
2.	MICHIGAN	1,537,000
3.	WISCONSIN	 1,400,000
4.	LOUISIANA	1,350,000
5.	PENNSYLVANIA	 1,300,000
6.	MAINE	1,255,000
7.	NEW JERSEY	1,105,000
8.	WASHINGTON	817,000
9.	ILLINOIS	776,000
10.	VIRGINIA	746,000
11.	MASSACHUSETTS	742,000
12.	FLORIDA	633,000

Georgia and South Carolina were totaled together—1,100,000—so it is possible one of them might belong in the "Big Twelve."

PAPER IN THE SOUTH Nine New Machines Start Production in Past Year

Advancement of the industry continued apace in the Southern states during the past year, marked not only by expansion and modernization but also in enlarged range of products. Of wide interest was the completion in early 1950 of the new fast Beloit Fourdrinier machine for production of lightweight kraft paper at Crossett Paper Mill (Crossett, Ark.). The machine incorporates some new features to make fast production of lightweights possible.

Another feature of the year was the expansion of conversion plants, many of these large units being in conjunction with the big kraft mills.

Into production early in 1949, the Macon Kraft Corp.'s 600-ton daily capacity mill is noted for a number of features ranging from unusual pulpwood handling equipment and layout to the high pressure steam driven 216-inch board-making Fourdrinier, the "Buccaneer," for board, both being rated as "firsts."

Coosa River Newsprint Co., near Childersburg, Ala., was poised for production on its two machines at the year's end. On Nov. 11 it made its first kraft bleached pulp and shipped to its new Memphis plant to convert to Kleenex. The two Coosa River Beloit 226-inch machines are twins, one being left-handed and the other right-handed. They ran first paper on Jan. 18, 1950. Considerable interest was manifested in this mill, which comes into production with its output contracted for. It is anticipated that steps will be taken to create additional newsprint capacity in the South. With Coosa in pro-



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PAPER-Continued



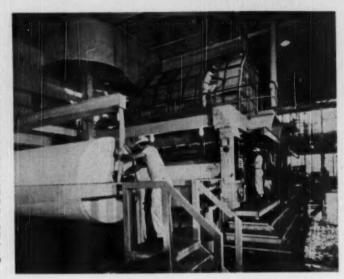


UNION BAG & PAPER CORP., whose big (five 234-inch machines) mill at Savannah, Ge., mode 1,485 tens of paper in one day for a new mill record early in 1950, has announced two new kraft paper products: Top-Special waxed newspaper bag which can be twisted at end to keep paper dry in wet weathor. Below--"Alligator" wat strongth treated gracery bag which will safely carry home wet goods.

duction there will be four modern machines supplying the newspapers.

At Lufkin, Texas, the Southland Paper Mills stepped up the speed of its two machines to produce an average of 370 tons of newsprint daily. Coincident with this, the management devoted considerable effort and attention toward improving the sheet, resulting in a more uniform and improved texture and finish. The mill's cylinder machine continued in its production of 65 tons daily of bleached specialties.

At Pasadena, Texas, the Champion Paper & Fibre Co. continued in its program to transfer production from Hamilton, ONE OF TWO
CERFED WADDING
MACHINES producing 16 ft. wide rolls
in Kimberly-Clork's
Momphis, Tenn.,
plant. This year it
began getting
blooched kruft from
file new Cosee River
roll. These machines
buve been in operation since '47 and
'48, their product geing into Kleenex and
Katar. Beloit medemachines in collaboration with K-C Cantrol Engineering and
fley have special
Valley Iron stack
entronces. These latout such machines
breught K-C's annual
creped wadding euput to 126,000 tons.
Il was early 44,000
three years age.



U. S., Canada and Newfoundland

Following are figures showing how the total paper production of U. S., Canada and Newfoundland has increased. (Early in 1949 Newfoundland was officially joined to Canada as part of the Dominion):

Year	Tons
1949*	26,754,242
1948	28,309,845
1947	27,255,170
1946	24,730,000
1945	21,965,000
1944	21,499,980
1943	21,252,032
1942	21,590,629
1941	22,637,141
1940	19,153,123
1939	17,410,144

*Canada estimated by Pur & Paper for the latest year. Other data from American Pulp & Paper Assn. and official Dominion Statistics Bureau.

Ohio. The paper machine addition, expanded to accommodate several units with adequate finishing space to serve them, was filled with a last unit in course of completion at year's end. The last machine was an entirely new machine, composed of parts produced by different manufacturers; and was planned to produce machine-coated paper.

Another expansion program completed was that of Gulf States Corp., Tuscaloosa, Ala., with its 170-in. machine named "The Warrior."

Although delayed by unfavorable weather toward the end of 1949, the Calcasieu Paper Mill, at Elizabeth, La., completed its new mill in the spring of 1950, representing a \$6,500,000 expansion. The new mill, built immediately alongside the old plant, adds 125 tons daily of bag and wrap on a new Pusey & Jones 160-inch machine.

The smaller but well equipped Austell Boxboard Co. mill at Austell, Ga., went into production with a Moore & White 6-cylinder machine.

Hollingsworth & Whitney Co., after en-

larging its water supply, launched into the construction of added capacity that will bring its production of paper upward by 50 percent. The Mobile mill will have its additional production into the field in 1950.

Another expansion program was launched by Hudson Pulp & Paper Corp. with plans to add a new machine—the second—at its Palatka, Florida, mill.

There is still talk of new mills in the South. The newest would be identified with the Dierks Lumber & Coal Co. (Kansas City, Mo.), with its location at Prescott, Ark. There is ample fee simple owned lands to assure the pulpwood supply for this project.

Riegel Paper Co., a traditional Pennsylvania and New York company, succumbed to the old Southern charm and started on its mill near Acme, N. C., but the management were no strangers in the South; timber had been ready several years and Riegel has textile interests there. Headquarters of Hudson Pulp & Paper in Manhattan announced groundbreaking in June at Palatka for its new "twin" to the present operations.

PAPER IN MIDDLE WEST Big Market Centers Here More Expansion Planned

It is notable that the quarterly downtrends and the firm-trends of business conditions in the paper industry in the Middle West for 1949 were analogous with the nation-wide papermaking pulse.

The quantity of paper contributed to the national total by Middle Western mills in fact helped make the chart-lines move. Its paper, in a wide diversity of products, went into its own large markets, as well as the markets of other sections.

During the early part of 1949 the Middle West mills had to ride out the uncertainty of the back-lash from familiar inventory conditions. The consumer was still buying the finished product. He was

SURVEY OF NEW PAPERMAKING CAPACITY IN THE UNITED STATES

(Copyrighted by American Paper and Pulp Association—Revised May 2, 1950)
Capacity Increases of New and Rebuilt Machines Shown on Annual Tonnage Basis

Grade of Paper	Capacity at and of 1948	during 1949	Capacity at end of 1989	Increases during 1950	Capacity at and of 1950	during 1951	Capacity at end of 1951
Fine	1,281,000	4,960	1,285,960		1,285,960	-	1,285,960
Book	2,482,000	3,100	2,485,100	48,515	2,533,615	-	2,533,615
Tissue	1,322,000	10,850	1,332,850	22,940	1,355,790		1,355,790
Wrapping and Specialties	3,559,000	229,400	3, 788, 400	105,555	3,693,955	49,600	3,943,555
Groundwood Papers	875,000	930	875,930	-	875,930	-	875,930
Hewsprint	893,000	31,310	924,310	108,500	1,032,810		1,032,810
Miscellaneous	110,000	-	110,000	-	110,000	-	110,000
Building Paper	1,389,000	-	1,309,000	-	1,389,000	-	1,389,000
Total Paper	11,911,000	280,550	12.191,550	205,510	12,477,060	49,600	12.526,660
Paperboard, Wet Machine and Building Board	11,478,000	264,560	11,762,580	147,095	11,909,675	7,750	11,917,425
Total Paper and Board	23, 389, 000	565, 130	23,954,130	432,605	24,386,735	57, 350	24.441.085

PAPER-Continued

still reading and subscribing. He was still buying tissues to comfort colds, despite antihistamines. He had the money for the quality that had been upgraded.

The smaller mills, most of them non-integrated, reflected the pessimism of the early months of 1949 the most. The large mills were the slowest to be affected, if at all. Many were keeping their sales steady through their own stimulation of consumer markets by institutional advertising. And with many, their own firmly-established brand-names, built by advertising, got first choice from the consumer reach.

Probably one of the most observed trends, in the eyes of all pulp and paper men, was the trend to the up-grading of paper. This trend was borne out back at the source where bleached pulps once more increased in tonnages.

The demand in paper is for brightness and opacity. The two, in themselves, are not entirely compatible at the papermaking stage and bring problems to the mill men.

Buyers of most printing papers, including book, index and ledger, sought more opacity after a high level of brightness was obtained.

New developments in papers, and improved papers, were finding stimulated outlets through many new applications for the consumer.

One Middle West mill was selling an envelope stock that improved the bond from the glue and thus had high sealing qualities. Another was selling the Lustre-Duster, a "tacky" dusting sheet that relieved the housewife from having available, and storing, dusting cloths.



ALL THE FOODS SHOWN ON THE COUNTER in this picture are wrapped or packed in Marathan-made packages and vroppers. The Waxtex box holds another Marathan product-household waxed paper.

Building papers became more diversified. Thilmany, a big producer in the Middle West, had several highly-developed laminations. It modernized its machinery in this department. One of its products embodied use of steel strapping and building-type paper for use in railroad cars that carried bulk enclosed products like grains. This replaced the solid-planking system of temporary bulkheads for car doors.

In tissues and sanitary papers, the Middle West mills continued to be leading producers. The trend to high qualities, and "whiteness," continued as the buyer wanted the best. It is presumable that these mills intensified their programs to advertise their name-products in tissues. More than one driver was confronted with a billboard for personal tissues admonishing him not to "put that cold in his pocket," at the same time his car radio melodiously played a singing commercial for another make of tissue.

Pulp from the LongLac Pulp & Paper Co.'s mill at Terrace Bay, Ont., was used



IN PAPER INDUSTRY, one of the most discussed 1949 developments was completion and sturtup Jan. S of this new streamlined St. Regis first mill in Yazama, Wash., (long building in foreground). Wing to left houses storage, offices and lab. In background is new backing plant, big concrete chip siles and pulp mill. Pussy & Jones 180-in. Four-drinler, designed for 2,100 f.p.m., has many new features.

PAPER-Continued

for the first time last year by the parent company's (Kimberly-Clark) Kimberly, Wis., mill for the manufacture of two grades of paper, one having outstanding folding strength for a high-grade "enamel" paper, and the other a special grade especially made for offset printers.

Many expansion programs were fulfilled in 1950. Middle West mills were out to maintain current good markets and bid for new papers and converted products to raise the consumer level.

Marathon Corp. opened its new Central Research Laboratory at Rothschild, Wis., late in the year. It is a credit to the entire industry. Fundamental and applied research will pertain to the company's products and processes.

Nekoosa-Edwards Paper Co. at Port Edward, Wis., modernized its No. 4 machine and increased the range of grades that can be made thereon. Another Nekoosa-Edwards improvement was new Fourdrinier sections for the Nos. 5 and 6 machines.

Hoberg Paper Mills at Green Bay put \$40,000 into new tile chests that have been completed and then announced a whacking \$3 million program for 1950 and 1951. The paper division will be enhanced with a new paper machine, a Beloit, that will be in operation by 1951 and will be No. 1.

The No. 2 machine will be rebuilt. There will be a new laboratory and new converting machines. New rewinders will be a part of the converting room modern-

Northern Paper Mills of Green Bay, Wis., announced in early 1950 that it plans new machinery for increasing its paper capacity. Northern will also be affected by the pollution campaign and its plans for its pulp department will be announced later.

At Oconto Falls, Wis., the Falls Paper & Power Co. announced additions for its buildings.

PAPER AND PAPERSOARD PRODUCTION BY STATES AND REGIONS

Data for 1947 are the latest available by states and regions, in tone and value.

	1947 Tune Value		1939 Value		
		f.o.b.mill(1)	Tone 1	'.o.b.mill (1)	
THITED STATES	21,114,000	\$2,819,082,000.	13,509,642	\$ 848,916,000	
NEW ENGLAND	2,690,872	447,291,000.	1,972,673	160,867,000	
Maine	1,255,582	166,133,000.	1,034,976	66,158,000	
New Hempshire	223,713	45,854,000.	166,211	15,297,000	
Vermont	102,519	19,762,000.	83,298	6,324,000	
Shode Island & Conn.	742,096 372,962	(d) (d)	160,729	10,971,000	
MIDDLE ATLANTIC	4,248,504	622,502,000.	3,043,700.	204,455,000	
low York	1,849,873		1,386,857	101,009,000	
New Jersey	1,105,145	141,724,000.	740,691	37,922,000	
Pennsylvania	1,293,486	*** *** ***	916,182	68,524,000	
LAST NORTH CENTRAL	5,589,682	775,295,000.	4,036,861	261,077,000	
Ohio	1,453,461	209,818,000.	961,265	63,014,000	
Indiana	391,693		267,056	12,327,000	
Illinois	776,221	69,138,000.	571,589	22,986,000	
Michigan	1,556,490		1,225,977	74,955,000	
Wisconsin	1,302,017	238,174,000.	1,010,974	87,795,000	
MINNOSOTA, IOWA,	860,810	96,549,000.	301,774	16,776,000	
Missouri and Kansas	860,810	95,549,000.	301,774	16,776,000	
BOUTH ATLANTIC	3,210,737	373,937,000.	1,235,909	64,820,000	
Detamare	50,291		14,843	1,984,000	
Maryland and D. C.	265,867		155,525	8,489,000	
Virginia	746,277		510,844	25,335,100	
Mest Virginia	25,713		55,897	4,260,000	
North Carolina	389,236		128,022	9,627,000	
So. Carolina à Georgi Florida	633,405		370,778	14,125,000	
EAST SOUTH CENTRAL	1,047,836	181,105,000.	116,374	5,619,000	
Termessee	211,284		116,374	5,619,000	
Alabama	374,512	42,234,000.	(3)	(3)	
Mississippi	462,040	57,455,000.	(3)	(3)	
WEST SOUTH CENTRAL	1,787,188		593,902	25,650,000	
Arkaness à Texas	444,629		(3)	(3)	
Louisiana	1,342,559	144,419,000.	593,902	25,650,000	
PACIFIC & MUUNTAIN	1,702,171		1,107,825	61,374,000	
Washington	816,709		552,577	32,387,000	
Oregon	371,626		260,402	15,399,000	
Calif., Colo. & Aris.	513,836	42,470,000.	294,846	13,600,000	
Other States in 1959			1,100,624	48,278,000	

School Bracks of the Caner

d-Withheld to avoid disclosing figures for individual companies.

A-Value of products calculated by multiplying production by average ton value shipments. 3-Quantity and value data for 1939 included in "other States."

In 1949 the Minnesota and Ontario Paper Co. finished up a large expansion program, begun several years before. The No. 4 machine was rebuilt to produce higher quality papers. Both bleached and unbleached sulfite and kraft can be used. The Fourdrinier section was rebuilt and four Bird screens added.

More than \$700,000 went into the new disposal plant for the woodroom. Many modern methods and machines make the woodroom noteworthy, including dewatering facilities for waste bark. Next is the new 100 ton bleached plant.

Manistique Pulp & Paper Co., high-up in Michigan, put in a new Fourdrinier section during the year, and Rhineland-er's still new "Ripco Maid" was completing its first year on glassine papers. Green Bay Box put in a board machine and expansion in use of hardwoods in paper and board products was continuing on many fronts, crowding the straw processes out or back to the wall.

PAPER ON PACIFIC COAST Eleven New Machines Rolling; New Products on Market

Growth of papermaking and paper conversion on the Pacific Coast is one of the phenomena of the industry and it is, of course, tied closely to the amazing growth of population on the Pacific slope. There has never been such a tremendous migration of population in the history of the world, as census figures of 1950 will show.

Food processing plants of all kinds, typified by the new huge General Foods plant which started up near Lodi, Calif.; a greatly increased demand for packaging in the bakery trade, the demand of stores for distinctive packaging, the need for frozen food packaging by the great fisheries industry of the west, as well as fruit, vegetable and other processors; the movement of all kinds of paper-using industries to the Far West, especially to Southern California; a steady flow to

			PAPER PE	OSUCTION BY	REGICUL			
	1940	1941	1942	1943	1944	1946	1946	1947
(Maine, New Hosp- shire, Vermont, Massachusetts,		2,406,429	2,268,258	2,296,765	2,187,109	2,228,375	2,838,513	2,696,872
R.I. & CORM.) MIDDLE ATLANTIC (New York, New Jorsey, Penn- sylvania)	3,223,314	3,869,795	3,896,077	3,489,789	3,467,629	3,515,762	3,942,975	4,248,504
EAST BORTH CENTRAL (Chio, Indiana, Illinois, Michi- gan, Wisconsin)	4,172,602	5,044,597	4,617,621	4,734,699	4,672,147	4,674,548	5,225,148	5,559,482
AND MOUNTAIN (Minmoota, Iowa, Missouri, Ranses	600,168	639,676	678,094	689,020	729,636	745,308	750,191	880,810
SOUTE ATLANTIC (Delaware, Hary- land, Dist. Col., Virginia, West Virginia, North Caroline, South Caroline, Goorgi Florida)	1,367,171	1,730,571	2,201,524	2,379,489	2,524,334	2,533,163	2,773,508	3,210,737
Termessee, Ala- bama, Mississippi		1,628,542	829,247	800,507	865,731	908,935	989,007	1,047,836
WEST SOUTH CENTRAL	824,789	941,582	1,411,077	1,335,601	1,358,672	1,417,791	1,561,737	1,707,108

Cregon, Calif.
Colo., Arisona)
TOTAL UNITED STATES-

PACIFIC STATES

14,483,709 17,762,365 17,083,862 17,035,688 17,182,804 17,370,965 19,277,867 21,114,000

1,240,133 1,411,174 1,401,964 1,300,828 1,387,646 1,347,066 1,491,860 1,702,171

Source. Sureau of the Census Compiled by American Paper & Pulp Association March 21, 1950

PAPER-Continued

dairies of more and more paper milk bottle machines from Pure-Pak division of Excello Corp., with American Can and Sealright also in this field, keeping pace these are all signs of the times. Along with this is the growth of the printing industry—an example, the mammoth new Pacific Press in Los Angeles printing Time and Life's western circulations with teletyped pages flashed from New York.

To meet these demands several new paper machines have started up in the past few years. Many other machines were speeded up. Crown Zellerbach's new bag plant at Port Townsend, Wash., Longview Fibre's two new corrugating plants in Oakland, Calif., and Los Angeles, the new Portco paper converting plant in Vancouver, Wash., expanding products of the parent Perfection Twine Co., which was at Camas; Milprint, Inc., plant there also, and, of course, the vast expansion in conversion at Crown's Camas mill, are striking examples of the growth of paper conversion.

In British Columbia, also, while most production is still mainly in news grades, there has been a consistent rise in volume of output of building and wrapping papers, tissues and specialties.

Here's the record of new machines on the Pacific Coast:

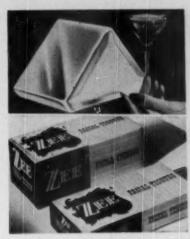
Powell River's new No. 8, made by

Dominion Engineering-226 inches wide, theoretically able to hit 2,000 f.p.m.

The new high speed Pusey & Jones 180inch Fourdrinier paper machine for which St. Regis built a fine new modern mill at Tacoma, which started up Jan 5, 1949. Innovations here will be discussed later.

Weyerhaeuser's containerboard mill at Springfield, Ore., with a 164-inch Rice Barton Fourdrinier, which started up late in 1949, is discussed more at length in our section on board. Likewise a Downingtown special hard fiberboard mill built by Stimson Logging Co. at Forest Grove, Ore. Last year was the first full year for Powell River Co.'s new high speed No. 8 machine by Dominion Engineering, discussed in the newsprint section of this issue, and also for Crown Zellerbach's all-purpose Beloit No. 15 at Camas, Wash.-152 inches wide with a speed range from 150 to 1,700 f.p.m.-which started up in April 1948.

Pacific Coast Paper Mills at Bellingham, Wash., started late in 1948 its new No. 2 Fourdrinier machine, replacing a cylinder and adding capacity and making possible an MD tissue protuct of facial tissue type quality. Valley fron headbox and inlet, Black-Clawson Fourdrinier and Beloit Yankee are features of this 85-inch machine. Now in mid-1950 a new Beloit machine is being added at this tissue mill, founded and operated by the Herbs from Wisconsin. In just the previous year, their Westminster Paper Co., of New Westminster, B. C., doubled production with a new machine.



COCKTAIL SIZE CELLULOSE NAPKIN, NAMED Supersoftias, made of three thicknesses of fasial type tissue, with a "help yearsel" fold, and special "non-tipping" chromium dispenser is announced by Greff Paper Co., 2300 Endicot \$1., \$1. Paul 4, Minn., by Gen. Myr. J. F. Meyer.

BELOW ARE SHOWN PACKAGES IN WHICH FIRST FACIAL TISSUE MADE ON PACIFIC COAST is packaged. Introduced to consumers during the past your under the name Zee, by Crown Zellerbach, made from tissue menufactured at the big Cames, Wish, mill, it comes in a "housteir bex" designed in ferminine shades. Two sizes are shown here—a 400 count and a 200 count bax.

A year ago Sydney Roofing & Paper Co., Victoria, B. C., added an 84-inch Fourdrinier machine, rebuilt around a purchased cylinder machine.

Work is being pushed on the new Potlatch Forests, Inc., kraft mill at Lewiston, Idaho, where a Rice Barton machine for quality kraft products will start up in January, 1951, and President William P. Davis told the Lewiston Chamber of Commerce this "may be just the start of a paper empire in Idaho" and that his company looks upon the first machine as just a "pilot mill" to test out estimates of possibilities. Newsprint is planned in Colorado in the recent sale of Forest Service timber to a group headed by Preston Walker, Grand Junction, Colo., publisher.

Container Corp. of America directors voted recently to authorize a new paper machine in its Los Angeles mill.

Biggest event in California, however, was the startup this year of the new Fibreboard Products, Inc., San Joaquin division at East Antioch, Calif., climactic event of a ten-year expansion and plant betterment program involving upwards of \$50,000,000 by that far-flung company. A complete description of the new division appears in our June, 1950, issue, published acon after this insue.

Two new machines in the new San Joaquin kraft pulp and paper division of Fibreboard Products, Inc., at East Antioch, Calif., newest mill in Western United States and described in June, 1950, issue of Pulp & Paper. On the Tuf-Fir (new corrugating material) side is a new Pusey

& Jones 156-inch Fourdrinier with GE sectionalized amplidyne drive, daily capacity, 110 tons. On the other side, where bleached kraft carton board is made, is a 136-inch Black-Clawson cylinder machine with GE multiple generator drive, capacity 125 tons.

Last year was the first full year for Fernstrom Paper Co.'s 160-in. Black-Clawson Fourdrinier on flat tissue, which started up March 18, 1948, at Pomona, Calif. It was the first big year for Angelus Paper Box's new Black-Clawson at Los Angeles also, and for U. S. Gypsum's new Downingtown machine in the same city.

Interesting in the paper field in the Far West is the introduction of new paper products.

Zee, the first facial tissue ever made on the Coast, a Crown Zellerbach product, had its first big year and along with it the comparatively new Town and Country facial tissue type napkins in large packages for restaurants and small ones for homes. The tissue is made on the Camas mill's No. 14, which early in 1950 took on the new type of pressure headbox developed by Beloit without baffles or partitions, using five rectifier rolls and incorporating air under pressure to maintain stock level and static head.

Publisheen, the first western-made coated book paper, came into its own this past year. This is the name under which Crown Zellerbach markets Monterey Gloss, made at the great West Linn, Ore, machine coating book mill and used for Life and Time western circulation and for other magazines. The western pulps give it an unusual opacity in light basic weight.

Publishers' Paper Co. at Oregon City, and Crown Z are making a new windshield paper towel for automobile service Wet strengthening of paper towels and of grocery bags are other Pacific Coast developments. New colors, like turquoise blues, etc., to meet more particular demands of stores for distinctive wrap has complicated the beater room rituals. Colored vegetable crate liners, while not really new, are more important on the Coast in the production line. Likewise, embossed Comfort toilet tissue came in for new marketing in 750 sheets to the roll. A neat and cheap lunch bag of kraft for school kids was developed.

Eyes of the industry all over the nation were on the new Tacoma St. Regis mill, because of its departures from old standards. Engineered by Justin H. McCarthy, a veteran of the Hardy S. Ferguson school, its airiness, roominess, straight line operation, corrugated glass and panel construction and use of reinforced concrete from basement to work floor, with steel above and welded steel trusses, are

U. S. PAPER PRODUCTION, IMPORTS, EXPORTS AND CONSUMPTION BY GRADES

(In Thousands of Tons)

				(In	Thousan	ids of To	ms)				
Year-	Produc-	Imports I	liports	Consum	Lbs. por Capita	Year -	Produc-	Imports	Exports	Consu	mption Lbs. par Capita
						-		Coarse P	apera		
899 914 924 929 934 939 941 943 945 947 946	1 773 3 860 5 079 6 775 5 173 7 484 9 362 8 415 8 457 10 705	2 Other T1 349 1,445 2,591 2,252 2,638 3,086 2,646 3,702 4,060 4,506 4,678	106 100 100 100 114 134 317 226 303 297 226 226	1,773 4,103 6,424 9,167 7,311 10,007 12,131 10,857 10,855 14,468 15,428 14,797	47 84 113 150 116 853 182 159 155 201 210	1809 1914 1924 1929 1934 1939 1943 1944 1945 1947 1948 1949	911 1,235 1,605 1,356 2,238 2,262 2,314 2,403 2,903 3,024	18 25 9 5 1.5 1 2.1 8 22 18	7 18 29 32 38 49 43 51 51 35 61	\$35 922 1,242 1,585 1,329 2,215 2,213 2,272 2,352 2,874 3,007 2,771	14 18 8 22 26 21 34 32 33 34 40 41
		Newsp	rint					Ties	ue		
900 914 924 929 1934 1939 1941 1943 1947 1948 1949	1,409 989 954 1,043 811 725 833 875 916	1 357 1 357 2 422 2 269 2 615 2 982 2 657 4 395 4 636 Book P	44 17 18 23 13 70 35 43 28 27 36	569 1.547 2.821 3.813 3.175 3.555 3.953 3.413 3.350 4.762 5.243 5.514	15 32 50 63 50 54 60 50 48 66 72 74	1899 1914 1924 1929 1934 1939 1941 1943 1945 1947 1948 1949 Beginni to fine (115 242 387 397 648 912 908 980 1,088 1,187 1,155 ng with 19 papers.	6 10 8 05 07 1 1 1 1 2 1.4 141, "Thin I		28 115 244 390 398 636 689 948 962 1,071 1,174 1,135 maye been	1 2 4 6 6 10 13 14 14 15 16 15 allocated
1914 1924 1929 1934 1939 1961	1,050 1,497 1,055 1,534	6 14 3 4 13 28	14 10 27 12 22 51	788 1,053 1,473 1,047 1,525 2,002	16 18 24 16 23 30	1914 1924 1929 1934 1939 1943	455 649 1,152 880 1,384	46 39 43 15	37 45 67 26 26 26	464 643 1,128 868 1,364 1,736	9 11 18 14 21 25
Beginni	ng with 19	41, test pag	ers allo	ated to fi	ne papers	1944 1945	. 1.809	2 2	25 41	1,787	26 26
1947	2,307 2,338	38 39 74 83 28 Fine P	31 62 76 16 33	1,589 1,458 2,206 2,365 2,146	23 21 31 32 29	1947 1948 1949 * Inclu "All Of Bource of Ces	2,500 2,579 2,267 des grounders," an Americas	8 8 5 dwood, abso d industrial a Paper and Departmen	93 46 23 orbent, b Papers	3,450 2,538 3,249 uilding p from 1941 sen. Fro	34 35 30 apers and i. m Bureau
1899 1914 1924 1929 1934 1939	269 422 635	1.3	3 4 16 10 24 46	131 266 419 620 425 708 903	3 5 7 10 7 11	152-i	nch "al	n-discuss l-purpos enough	e" No.	15 at	Camas,

From 1899 to 1940 inclusive, only writing and cover wer included in fine papers. Beginning with 1941, text paper (from book), bristol (from puperboard), and "this papers" (from tissue) have been added.

features now talked about all over the nation in this industry. The Pusey & Jones machine has not been pushed anywhere near its theoretical 2,100 ft. per minute speed, because the mill still markets part of its pulp. New machine features are a new pressure inlet, with hydraulic high speed nozzle slice; first extensive applications of hydraulic high pressure oil pump driven motors for suction box, press, dryer doctor oscillators, winder dumping, etc.; individual General Electric electronic-amplidyne speed regulation of each section: extensive uses of stainless steel; color-coding of all process piping and electric conduit; original Drew Engineering heating and ventilating systems. In auxiliaries, there is the first Hercules automatic emulsifying process in the West; first Shartle-Dilts Hydrapulper for broke in the West; a filtered electric room with constant outward pressure engineered by Drew to keep out dirt and moisture; a special control and magnetic drive for the 30,000 g.p.m. fan pump; 45 two- and three-way special DeZurik valves; the battery of E. D. Jones magnetic jordans with special recording and other features.

some of its features. Batteries of Morden Stock-Makers and E. D. Jones Majestics ahead of it give it versatility. Beloit made the machine, equipping it with standard and also secondary slice. It is automatic push-button controlled from slice to reel transfer. There are two suction presses and one smoothing press; marking or smoothing press is between first and second dryer sets; size press between second and third. Cameron adjustable speed winder can hit 4,000 f.p.m. Pneumatic tube system "a la department store," take samples for testing across railroad tracks to another building. Ross designed hood and exhaust system and Drew a Hi-Jet system for dryers.

Longest and biggest facial folding machine, with three decks of rolls—130 parent rolls in all; a high speed 70-in. Dilts waxer, and other automatic machines feature unusual finishing and converting equipment at Camas.

Other interesting paper mill improvements of past year on the Coast include: At Port Townsend, Wash., division of Crown Zellerbach: A new Swenson-Nyman washer, five new Bird Jonsson knotters, a new No. 185 Bauer Bros. pulper and three Morden stock-makers ahead of existing E. D. Jones beaters and jordans,

which practically make "new" machines of the two machines at that mill. At Port Angeles, Wash., Crown Z: Second suction presses by Beloit for all three

big machines—helping them reach new record.

And changing of drives for speeding up West Linn machines and other speedup changes on several West Linn and Camas machines.

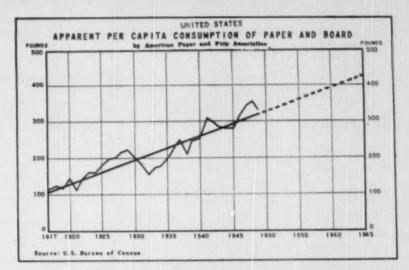
The paper market available to Canada's West Coast mills for these products is pretty well confined to domestic territory, as devaluation of currency, shipping and other complications have reduced exports overseas during the past few years. However, the mills have been able to sell in territory as far east as Winnipeg, and the steady rise in population throughout Western Canada has given a stimulus to expansion.

Chief producer of kraft paper is Pacific Mills at Ocean Falls, which also produces tissues and specialties. Powell River Comanufactures laminated building papers in addition to its dominant newsprint production. Westminster Paper Co. at New Westminster has a diversified line ranging from printed fruit wraps to towels, facial tissue and waxed papers. For all these products there has been a strong demand during the past year, and production is expected to show an increase in 1950.

PAPER IN NORTHEAST New Machines in Few Mills Tariffs Are Major Worry

The year 1949 until the middle of 1950 ranged from empty warehouses to rather full ones, but this had been expected. It had been pegged accurately by the statisticians. Inventories would again be built up when we got about here. The "here" was a rather embarrassing time, coming as it did just before midsummer and facing into the vacation month of July. Prices were getting spotty, paper was moving very slowly out of the printing shops.

It was a queer time, but it was by no means even a recession. Newspaper publishers, in annual meeting at the Waldorf. New York, were again threatening the newsprint industry, which they had driven out of the U.S. into Canada years ago and were discussing new mills. Would a group of publishers who did not want to pay a hundred dollars a ton want to throw in on the cost of a mill todayperhaps, \$30,000,000, at least \$25,000,000? It did not seem likely, which is perhaps why the secretary of the Association of Pulp consumers sent a wire urging they join the fight against further tariff cuts on groundwood, book, specialty papers and converted products. This was just another one of the queer things that somehow made sense-that the publishers would blaze out a defense of white paper mills at the same time they were blasting away at newsprint when the industry might be threatened with Congressional investigation instigated by the Newspa-



Apparent consumption comes very close to the trend line after having been above it for the years 1948, 1947 and 1946. If it be assumed that per capita consumption will continue to grow at the rate indicated by the trend line it will reach 432 pounds by 1965. This would mean over 35 million tons of paper consumed in 1965, based on Census population forecasts. The following table shows these consumption figures by five year intervals, commencing with 1950.

PAF	ER AND B	OARD CO	RSUMPTIC)N		
	1950	1955	1960	1965	1970	1975
Lbs. Per Capita	331.2	364.7	398.3	431.8	465,3	498.9
Potal Tone (Williams)	04 0	00.4	91 0	95.4	90.9	40 9

per Guild. And almost at this very moment some publishers rushed to sign for spot market Scandinavian newsprint at \$25.00 higher than the U. S. price! If the newspapers built new mills, the marginal newsprint mills of Canada would certainly turn to other grades and certainly there'd be no production expansion north of the border. Which might be chasing the industry from North America to Scandinavia!

Book sales were idling, and the dollar picture books were all that sold in many stores—yet Bond Wheelright, the Manhattan publisher son of William Bond Wheelright, writer and agency man well known to the New England industry, sold 337 copies of a special edition of a-long-version of Hamlet expanded by Percy McKaye. The price, \$100 per copy!

One of the smart new uses of paper (in this case Nibroc towels) was for wiping the tents of dairy cows with a paper towel. Many believed the picture and story merely "gag" publicity (Pulp & Paper, cover picture, April 1950 issue), but it was considerably more than that to the venerable Brown Company which had made a penetrating market study of U. S. udder hygiene and multiplied by

The 1949-50 period was good but not unusual for new improvements and equipment. Oxford Paper Co., New York & Pennsylvania Co., and S. D. Warren Co. were among the few that began or wound-up overall expansion, although new machines were not wanting for the Northeast record. Quiet but up-and-

coming Great Northern in Maine celebrated both the New Year and Christmas of 1949 with new Rice, Barton newsprint machines. The Paterson Parchment Paper Co., Bristol, Pa., got its Rice, Barton machine going in late spring. Busy as bees already with a new Southern mill Hollingsworth & Whitney of Boston set out for equipment changes in the Maine mill. And in the thin-paper field the Schweitzer organization of Jersey bought the Smith interests of New England and began rearrangements and improvements plainly headed toward more of the cigaret market now that Ecusta had joined with Olin Industries to make Cellophane.

Widening use of radio-isotopes as indicated by Tracerlab in Boston, emphasized that the industry was entering the atomic period. And mill men who saw General Electric's "More Power to America" train in New York in April, got an exciting inkling of power developments, new drying lamps, gas turbine engines, automatic controls, beta rays, etc.

Guy Beckett and his cousin William Beckett formed Franconia Beckett-Franconia, Inc., to make a bid with their associates on Marcalus Manufacturing Co., Lincoln, N. H. From out of Jersey, the Marcalus headquarters state, came a mysterious Solvar Company, Clifton, N. Y., whose owners (not industry men) made a bid which the Becketts did not answer, but PULP & PAPER was advised by William Beckett in May that his new company has not abandoned the idea of an integrated operation in the Northeast, or elsewhere. The Marcalus operation,

consisting of groundwood mill and paper equipment, was bought from Parker-Young some years ago.

Biggest news of 1949-50, because of its potential possibilities, were the tariff reductions which, however it might be protested were not simply the notions of the State Department but part and parcel of the ECA program. On May 24 was scheduled a third round of concessions and this one would take up groundwood printing papers, book papers, tissue, drawing paper, converted paper products.

Most unfair of all, spokesmen for the industry were making preparations to say in Washington, is the fact that it takes a year or more for the effect of devaluated currency and tariff slashes to be fully felt. What the Annecy France agreement slashes of 1949 will do to glassine and other papers in that list was not yet known-thus the industry defense is weakened, the load piled higher by State Department before either State or the mills know the extent of damages possible. Consumer mills, with which the Northeast abounds, felt doubly vulnerable. Their profit margin is thinnest of all mills, perhaps averaging half the nonintegrated average, once in 1948 it had come within sight of zero.

It would be a tough battle and odds against, in all probability. The ECA was determined to improve the Marshall plan countries, the president was stubborn on a world trade in which the U.S. must buy heavily, and the State Department was out to "help." Yet in this strangely queer midsummer no part of the industry could prove it had been hurt.

PAPER IN EAST CANADA **Expansion Aimed To Make Papers Other Than Newsprint**

Newsprint may dominate Canadian paper production with a ratio of about 5 to 1, but fine papers, kraft paper, tissue and various other grades other than newsprint represent important segments of Canada's overall paper industry.

Including Newfoundland, which entered the Canadian confederation last spring, Canada's total paper output in 1949 was about 6,450,000 tons, and of this papers other than newsprint represented about 1.500,000 tons.

Although kraft paper and various types of tissue and wrapping are manufactured on the West Coast, the bulk of the Canadian output of paper other than newsprint is concentrated in the East, the principal producers of fine papers being Alliance Paper Mills, Don Paper Co., B. Eddy Co., Howard Smith Paper Mills, Provincial Paper and Rolland Paper Co.

Canada's fine paper industry has been organized to serve the domestic market almost exclusively. Book and writing paper sales in 1948 were divided as follows: Exports, 15,474 tons or 8.5%; domestic, 182,339 tons, or 91.5%. Value of produc-

CANADIAN PAPER PRODUCTION

	New	sprint	Total Paper		
	Tons	\$ Value	Tons	\$ Value	
1917	689.847	38.858.084	853 689	58,750,341	
1922	1.081.364	75.971.327	1.366,815	106,260,078	
1929	2,725,331	150.800.157	3.197.149	192,989,252	
1932	1,919,205	85 539 832	2.299.767	114,115,570	
1939	2.926.597	120,858,583	3,600,502	170,776,062	
1941	3.519.733	158,925,310	4.524.776	241,450,292	
1943	3.046.443	154 290 163	3.966.344	235,362,958	
1944	3,039,783	165,655,165	4.044.376	255,545,841	
1945	3 324 039	189.023.736	4.359.576	282,837,614	
1946	4.162.158	280,809,610	5.347.118	396,956,390	
1947	4,474,264	355,540,669	5.775.082	507.101.277	
1948	4,640,336	402.099.718	6,063,646	582,346,000	
1949	5,175,000*	464,000,000°	6,425,000**	614,000,000**	

Source up to last year Dominion Bureau of Statistics. *Estimated by Newsprint Association of Canada.
*Estimated by PULP & PAPER.

CANADIAN PAPER PRODUCTION BY PROVINCES

(Quantity in Tons-Value in Dollare)

Years		Quebec	Ontario	British Columbia	Other Provinces	TOTAL
1945 Tops 1945 Value 1946 Tops 1946 Value 1947 Tops 1947 Value 1948 Tops 1948 Value	•	\$148,180,691 2,867,594 \$213,045,633 3,099,658 \$269,588,727	1,267,796 \$86,395,223 1,579,537 \$120,929,769 1,730,965 \$158,603,917 \$187,182,675	334,502 \$20,353,984 270,950 \$26,733,893 412,818 \$35,342,443 **410,994 \$40,317,091	464 836 \$27 .907 .716 \$29 .037 \$36 .247 .095 \$31 .641 \$43 .566 .190 \$51 .155 .793	4 .359 .576 \$282 .837 .614 5 .347 .118 \$396 .956 .390 5 .775 .082 \$507 .101 .277 6 .063 .646 \$582 .346 .842
S Wasterstad by 1	DETERM A FRAN	TARTER AND DE-	Delaist Calembia	Manage Massiles	Oaker dete to late	as annillable form

tion in recent years has been approximately \$40,000,000

Because of the protected domestic market, the Canadian manufacturers of fine papers have been obliged to maintain a wide and flexible range of production, running all the way from halftone printing and rotogravure containing 67 to 70 percent of groundwood pulp to betterquality book and bond papers containing chemical pulp only and up to the highest grades of writing and bond papers made exclusively from new rags or flax pulp. Prices have ranged during the past year from about \$125 per ton up to \$1,000 per ton.

In basis weights the range runs from onionskins weighing about 32 lbs./M 22x34 up to bristols weighing about 450 lbs./M. Within this broad range are a great many grades and types. Howard Smith Paper Mills, for instance, makes about 200 different grades and brands of fine papers on six out of eight machines and, in addition, makes several grades not strictly included in the fine paper cate-

Kimberly-Clark Corp. announced plans for doubling the capacity of its mill at Kapuskasing, Ont., which has been devoted to manufacture of crepe wadding since the first plant was built five years ago. Total cost of the project, which has already been initiated, is estimated at more than \$3,000,000. Costs have been high, because of limited and varied markets for many fine paper mills. For instance, cigaret paper is made on one machine at the Beauharnois mill of Howard Smith, but there is not sufficient demand for the product to keep the machine in full production on that type of paper, and to keep it in full operation it is used

CANADIAN PAPER PRODUCTION 1948 (Latest Available)

	Tons	Value
Newsprint	4.640.336	\$402,099,718
Book paper	78,346	14,934,574
Fine papers	80.839	30,868,069
Groundwood specialty	72.423	9,376,325
Paperboard	707.520	68,793,713
Tinoue	69.686	13,927,917
Wrapping.	207.128	31,036,805
Industrial	9,002	1,869,758
Building papers	88.454	7,368,975
Building boards	109,912	12,070,987
Total Seurce: Dominion Bure	6,063,646 au of Statistics.	\$582,346,842

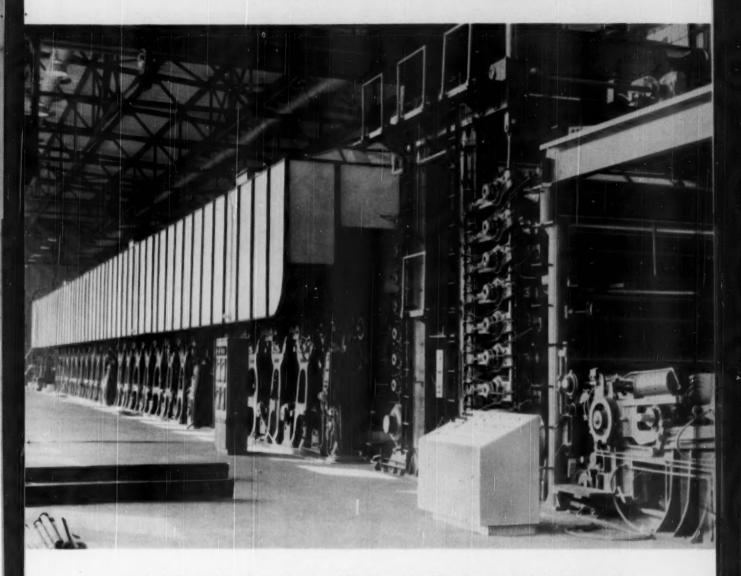
sometimes to make rag content bond papers with a basis weight of five or six times that of cigarette paper. While this may be an extreme case, it is representative of the type of operating problem which faces Canadian fine paper mills frequently.

Even if U. S. tariffs were removed it would be some time before Canadian producers of fine papers could put themselves in a position to compete in the United States with American mills.

There have been few significant technical developments in the paper industry of Canada during the past year. A paper mill in Cornwall, Ont., has been using a Waco filter, initially developed in Sweden, as a white water saveall.

One of the reasons for increased production at Canadian specialty mills last year was expanded use of waxed paper products in industry and in homes.

Several specialty paper companies undertook or completed mill improvements during the past year. Dryden Paper Co., for instance, recently installed a new paper machine. Alliance Paper Mills recently added automatic indirect cooking equipment at its sulfite mill and dryers were extended on the Don Valley machine. Canada Paper Co., a Howard Smith subsidiary, has been continuing a Gulf States: kraft bag and wrapping



In the Gulf States Paper Corporation plant at Tuscaloosa, Ala., this modern 170" Beloit High Speed Kraft machine—"The Warrior"—is turning out high-quality kraft bag and wrapping paper for the E-Z Opener Bag Company, Gulf States' Sales Division. All three machines in this mill are products of Beloit, the first built in 1901, the second in 1928. E-Z Opener Bag Company operated the 1901 machine at Braithwaite, La., before having it rebuilt by Beloit and moved to Tuscaloosa.—Beloit Iron Works, Beloit, Wisconsin.

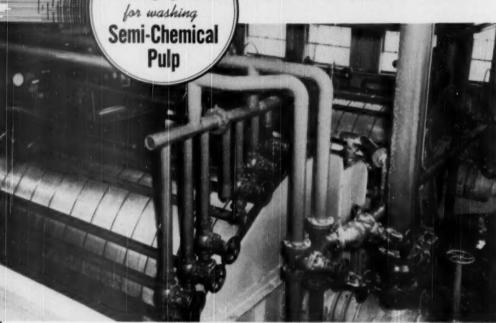


WHEN YOU BUY BELOIT ... YOU BUY MORE THAN A MACHINE! I

BELOIT

PAPER MACHINERY

RINGVALVES



book could be written about the wide use of the Oliver Ringvalve Filter for washing sulphate and sulphite stock . . . how its unique design and uniform sheet promote high washing efficiency . . . how its flexibility permits wide variations in washing methods.

Here's a "Ringvalve" installation at Sonoco Products Company, Hartsville, S. C. where the filters are operating on semi-chemical pulp and doing a fine job . . . more evidence of the versatility of the Oliver Ringvalve Washer! At present the two filters are operating as a 4-stage, series washing system. Later, when the tonnage is doubled, a third unit will be added and the system changed to 3-stage counter-current washing.

With such a fine record being made by the Oliver Ringvalve Washer in over 30 mills-a record of high washing efficiency, flexibility in operation, sustained overload or surge capacity-can you afford not to investigate fully its merits for your pulp washing requirements?

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PULP & PAPER

1950 Review Number

modernization program started two years ago at its Windsor mills.

One of the most diversified producers in Eastern Canada is E. B. Eddy Co., which completed a new bleach plant at Hull, Que. The company makes specialty paper, tissue and serviettes, hanging paper and towelling, and grocery bags. Fraser Companies brought its new kraft mill into production this year at Newcastle, N. B., serving the paper mill at Edmunston, N. B. Provincial Paper, Ltd., with four mills, is the only producer, at its Port Arthur plant, of machine coated stock in Canada. Equipment was installed in 1948. Rolland Paper Co., producing high grade bond, writing, offset and mimeographing papers, has completed a \$1,000,000 rehabilitation program.

Howard Smith Paper Mills, which has

taken over Donnacona Paper Co. during the past year, is the largest Canadian producer of fine and specialty papers. A \$10,000,000 expansion program was initiated in 1947 and about \$4,000,000 of that was spent last year in various plant improvements

Expansion in Conversion Of Paper on West Coast

Paper Products Division of Portco Corp., manufacturing bags, twines and cords from paper, went into production recently at a new plant site at Vancouver, Wash., marking a further significant step in increased conversion on the Pacific Coast

This organization originally started in 1928 at Camas, as Perfection Twine Co., manufacturing only twine products. James W. Duvall, previously a superintendent of the Crown-Willamette Paper Co. bag plant in that city, started the twine plant as well as inventing the twine machinery used.

The organization name was changed last year to Portco Corp., since many products other than twine are now being made by the firm. The plant was moved to Vancouver location, where larger facilities, lower freight rates, and general customer convenience are available. Paper for bags alone is used at rate of 20,000 lbs. per day, and 10,000 lbs. is used in twine daily. Specialties include extra large bags such as mattress and automobile covers.



PORTCO CORP. opened its Paper Products Div. plant in the new Yoncouver, Wash., location in 1949. The plant formerly operated at Camas, Wash., under the name Perfection Twine Co. At Top-New Venceyver plant.

Centur-Victor Rick, Research Engineer, tests tensile strength of paper twine made at Vancouver. New products are also developed in this lab.

Bottom—This fantastic-lacking machine twists rolls of paper tissue into one thick strand of seaming cord which is then used in farniture upholstery. Twines, cords and paper bags are also made at the Vancouver plant.

TOTAL PAPER PRODUCTION IN UNITED STATES

(Tens of 2.000 lbs.)

Year	Newsprint	Book	Groundwood	Fine	Wrapping (Coarse)	Tienue	Sanitary	Absorbant	Building Papers	Other Paper	Total All Paper	Total Papers
1899	569,212	304.459	*	131,456	535,252	28,406			*	*204,697	1,773,402	2,167,593
1924	1,481,425	1.050.000		422,000	1,235,000	242,000				°649,560	5.079.985	7,929,985
1940	1.056,304	1,655,423	550,453	735.753	2,500,818	733.894		129,410	582,460	60,120	8,104,635	14,483,709
1942	967,211	1,704,029	610,168	1,055,475	2.713.738	733,894 170,653	811.343	64 530	1,001,383	16,148	9,114,678	17,083,862
1943	811,309	1.592.878	585,673	1,020,601	2,501,637	162,766	806,023	88 254	877,582	129	8,446,883	17,035,684
1944		1,435,785	593.094	974.372	2,559,447	157.540	807,893	64.530 88.254 90.107	861,246		8,220,236	17,182,804
1945	725.475	1.501.015	636,026	1,000,794	2,403,182	157.083	823,705	88 643	883,259	238,047	8,457,229	17,370,965
1946	772.797	1,933,428	775,779	1,160,411	2,690,490	183.837	860,658	88,643 102,811	1,035,639	271 643	9.787.493	19.277.667
1947	833,036	2,207,923	821.318	1,171,539	2,903,450	194 624	894,032	100,446	1,289,109	289,499	10.705.018	21,114,000
1948	875,760	2,338,671	808,110	1,141,702	3,024,846	205.095	982 644	107,301	1,348,321		11,148,350	21,921,757
1949	916,042	2,151,759	804,810	1,027,309	2 927 330	199 189	956,265	79.458	1.112.688	315,900 270,264	10.345.114	20 304 243

Source: American Paper & Pulp Assn.
Last year's data complied from monthly survey.

**In 1899 and 1924, groundwood, absorbent sasitary and building papers are included in "Other Paper."

THE BOARD SECTION

FIBERBOARDS AND PAPERBOARDS

The additional uses being developed for pulp and paper boards, the development of semi-chemical pulping of hardwoods or waste wood materials along with straight defibrating processes, the growth of frozen food and other new foods markets, the uses of new types of building boards in construction—all of these factors have given impetus to the fiberboard and the paperboard industries of North America.

In paperboard, it is true that the slight recession in 1949 in all industries, was likewise felt by these manufacturers. But their recovery was strong. U. S. paperboard production in 1949 was 9,959,129 tons, third best in history—it hit 10,733,407 in 1948 and about 300,000 less in 1947. But '49 was 50% higher than '40 and more than that over previous years.

It should be stated that setup boxes countered the trend and set a record of its own in 1949—600,730 tons—about 5,000 over 1948. And "other boards" were a million tons over past years. Building board production dropped 30% in '49, due to a strike in one of the largest mills and a strike in a customer-industry served by another big producer. But output has more than doubled in a decade. In Canada, paperboard production was 40,000 tons less than 1948's record of 884,500 tons, but about 13,000 ahead of 1947. Exports were down 30% to only 12% of output.

Frozen food packs hit a record high in 1949, according to Western Canner & Packer, a Miller Freeman publication. Most of this was packed in paperboard. Canned food packs, where less board is used, were lower. U. S. food packing was brisk in 1949 and promised to continue so through 1950. But profits were lower; prices were lower.

PULP & PAPER'S exclusive report from Western Canner & Packer further states: Production in 1950 is expected to be little changed from 1949. Canned foods will probably decline a little. Frozen foods are expected to go up 5 or 10%. (Frozen concentrates are still going up in production, and are the spearhead of this frozen gain.) Dried food packs may be down a little, except for milk, which is likely to be little changed. Glassed foods appear to have settled down to a reasonably strong basis, and are not likely to change much.

"In canned foods, there is a possibility of greater use being made, perhaps in 1950, perhaps not until another season or two, of the idea of packing half a dozen or a dozen cans in a carton, and then putting several cartons together in a case. This system is used by some baby food packers, with success. It permits packing mixed cases, and it also allows wholesalers and chains to break up a case into smaller units without a lot of hand labor. In frozen foods, packaging practices remain unchanged, except that the growth of concentrates has caused a rise in the percentage of the total frozen food pack put up in cans. The cans, of course, are assembled in fiber cases, so this is still a gain for the paper industry. In dried foods, dried fruit packers still seem to be moving a little more toward the use of bags for retail sale, at expense of cartons."

BOARD IN NORTHEAST Semichemical Groundwood Now; Paperboard Developments

The opportunities opening for uses of the heretofore not-so-valuable hardwoods of the Northeast section of the United States has spurred interest in new mills to manufacture fiberboard for corrugating or similar materials by the semichemical and high yield processes being rapidly developed in 1949-50.

The manufacture of semichemical groundwood from hardwoods was announced in the spring of 1950 by the New York State College of Forestry at Syracuse, N. Y. It consists of a mild chemical pretreatment of aspen, birch, beech or maple in block form in digesters and mechanical defibering afterward, in a conventional grinder. The treated hardwood is ground with one-half to two-thirds of the power and at double the production

rate, of spruce groundwood. The pulp is three to four times as strong as ordinary softwood groundwood. Yields of 85% or more are reported. Pulps may be bleached with peroxide or calcium hypochlorite to equal brightness with other groundwood.

The St. Regis Northern New York operations are experimenting with this new groundwood process and are among those companies primarily interested in pioneering semichemical processes and bleaching of hardwoods. So are major New England mills.

West Virginia Pulp & Paper Co., at its Covington, West Va., plant, has pioneered in semichemical defibrator processing of all kinds of woods from hickory and chestnut to scrub oak for .009 board. The earliest Asplund trials were made at the Ruberoid mill in Gloucester City, N. J., visited by PULP & PAPER some years ago and described then.

The paperboard industry of the Northeast experienced a recovery in late 1949



PAPERBOARD BOXES (this one with cellulose podding fillers) have gone to the air in many ways, as new uses are developed and more goods are flown.

AIRBORNE PERISHABLES, Inc., Stapleton Airfield, Denver 7, Colo., provided PULP & PAPER with this picture of its gift type bax with which Colorado Rainbow trout is flown fresh to tables on the east coast and other points.

and 1950 and looked forward to the future with reserved optimism.

In this field, a major subject of interest in the past year was the Gibraltar Corrugated Paper Co. at North Bergen, N. J.

First new mill for the Northeast boxboard industry in a quarter century was put into full operation in 1949 with improvements still under way early in 1950 at Gibraltar. The box plant for Gibraltar had been operating at the North Bergen location for 25 years, an outgrowth of early Brooklyn operations, and until 1947 had purchased its paper. The mill under discussion had a few operating months in that year, furnishing .009 point paper requirements-but improvements and changes were so steady, and shutdowns for revisions so regular, that the paper mill can be said to be a 1949 mill. It is now adding coated book paper laminated on 12-point kraft for food wrap. The machine at Gibraltar is a Bagley and Sewall 142-inch trim with 69 four-foot dryer rolls and Black-Clawson drives. Some improvements were also made to the box plant, including an 85-inch Samuel Langston combining machine. A complete description of the new Gibraltar paper mill appeared in our February, 1950, issue,

Northeast buying in the fiberboard field was strictly hand-to-mouth in the first

PAPERBOARD HILL CENSUS

CONTAINERBOARDS

				CURTAINE	KBUMMO					
GRADES	- 1940	1941	1942	1943	1944	1945	1946	1947	1948	1949
LINERS Jute	796,400	1,074,300	820,800	1,088,000	1,164,600	1,185,700	1,265,400	1,353,200	1,167,500	804,400
Kraft Cylinder Kraft Fourdrinier Total Kraft	THE REAL PROPERTY.	1,201,300	- market stage - 1 mile	1,252,900	Property and the last	97,100 1,308,000 1,405,100	1,311,900	Committee of the Commit	1,906,400	Market Construction of the Construction
TOTAL LINERS	experience of the Party St. Lincoln	the second second	resident patientes	M. of Street, St. St. St. St.	The state of the s	2,590,800		many of ground days on the	- Interest to the last	
CORRUGATING MATERIALS				798 to 10-11-12-12-12-12-12-12-12-12-12-12-12-12-				-		
Straw, Bogus, Etc. Eraft	611,400	806,400	662,800 269,300	872,100 157,600	969,500	956,900 154,600		1,261,900		
TOTAL CORR. MATERIALS	903,400	1,132,600	932,100	1,029,700	1,089,900	1,111,500	1,263,100	1,420,300	1,386,500	1,339,200
CHIP & FILLER BOARD Corrugating Solid Fibre	75,500 202,800	77,900 273,000	72,200	85,800 332,700	96,800 338,200	83,000 314,500	114,200 214,600	81,600 248,900	87,300 234,000	70,600
TOTAL CHIP & FILLER BD.	278,300	350,900	403,000	416,500	435,000	397,500	328,800	350,500	321,300	269,800
TOTAL	3,147,600	4,044,400	3,607,300	3,939,300	4,123,100	4,099,800	4,515,700	4,902,100	4,972,300	4,602,400
				BOXBO	ARDS					
Folding Box Set-Up Box Total	613,200	731,500	615,900	599,000	543,100	1,847,000 511,600	474,100	601,500	639,500	662,500
Other	1,144,200	1.365.800	1.363.000	1,361,000	1.494.300	1,456,300	1.418.400	1,564,900	1.744.300	1,668,500
TOTAL	-	The same of the same of	-			3,814,900		The second second	Committee of the last of the last of	- Constant
				SUMM	ARY					
JUTE, Liner, Corr., Chip, Boxboard, Etc. KRAFT, Liner, Corr., Etc.	4,632,900	5,903,400	5,220,400	5,857,700	6,117,600	6,031,200	6,524,900	7,002,100	6,835,900	6,196,100
TOTAL ALL GRADES		-		The same of the sa	-	7,914,700		1	-	Contract Contracts

Issued, March 10, 1950

NATIONAL PAPERBOARD ASSOCIATION

BOARD-Continued

half of 1949, with purchasers buying very closely to current needs. Some fiberboard executives stated they had never seen orders in such small quantities. The rate of decline, however, leveled off in the last half and has since remained on a much more optimistic level, although there was some spottiness and some price weaknesses showing up in midsummer.

BOARD IN MIDDLE WEST Semichemical Pulping Increases Big Board Machines Hit Peak

One of the major phases of the fiber-board and paperboard development in the Middle West was the conversion of hardwoods and waste wood from furniture plants, box plants, etc., to new products—touching new sources of wealth and employment for region that was not so long ago considered to have dissipated much of its wood resources. Instead, 1950 saw even the strawboard industry of the Middle West, based on the great agricultural residue, being given a real run for its money by a new semi-chemical and neutral sulfite or sulfate process for yields

and quick cooks of wood waste or hard-

Waldorf Paper Products Co. in St. Paul, Minn., and American Box Board in Michigan have changed over from straw to neutral sulfite processes using wood and these were harbingers in a mnjor trend of the pulp and paper industry. Most everyone knows of the new Green Bay Pulp & Paper Co. at Green Bay, Wis., based on waste of the Green Bay Box firm, a pioneer in neutral sulfite cooking. At Otsego Falls Paper Co. in Otsego, Mich., PULF & Paper has already described the hardwoods process using Bauers and Sprout Waldron machines.

Consolidated Water Power & Paper Co. has built a new semi-chemical plant at Wisconsin Rapids, Wis.; Watervliet Paper Co., at Watervliet, Mich.; Cornell Wood Products in Cornell, Wis.; American Pulp Co., Filer City, Mich., were among the converts to the new neutral sulfite semi-chemical pulping process for board products. A sulfate semichemical plant is at Tomahawk, Wis., now the National Container Corp. of Wisconsin.

The Midwest has always been a major factor in the paperboard field.

At Kalamazoo, Mich., Sutherland Paper Co.'s new No. 4 is now a major addition to the paperboard industry. This Black-Clawson machine is adding 100 tons daily. It is housed in a handsome new building. There was everything to go with the new machine, including a complete new Shartle-Dilts stock preparation system.

Just after the turn of the year, Gardner Board & Carton (formerly Gardner-Richardson) announced a \$1½ million expansion. It will be at Lockland, Ohio, and will be a one-story concrete building near the present carton plant for retail boxes. In 1949 Gardner completed a \$1 million improvement in new power generating facilities for the No. 2 Mill Power Plant at Middletown, O. It included new boiler, coal and ash handling equipment, feedwater treating, GE generators and automatic controlling.

And 1949 was the first full year of operation for "The Angel," the big board producing machine at the Michigan Carton Co., Battle Creek, and another great machine at Alton Box Board Co., Alton, Ill., was in its second year.

Kieffer Paper Mills, Ewing, Ind. found itself mighty busy rebuilding after fire had destroyed its plant. The new construction is steel, concrete and brick. The architecture and painting is very modern. The mill has three machines. It produces

BOARD-Continued

packing papers, crepes and papier mache boards.

One of the big events of the year was at Baltimore, O., where the Fairfield Paper & Container Co. opened its new mill early in the year. The cylinder board machine was made by Black-Clawson. The new mill was turning out between 100 and 150 tons of test liner and chipboard per day. Other improvements were concurrent, like the new steam plant.

At the Three Rivers, Mich., plant, the Eddy Paper Corp. started what is judged to be the second largest corrugated paper producer. The machine, built by Samuel Langston Co., is completely automatic. The old 82-in. machine was dismantled and shipped to Eddy's plant at Belleville, Ill., where construction of new buildings, with equipment, was progressing rapidly.

American Box Board Co., Grand Rapids, Mich., virtually completed its \$3 million semi-chemical plant at Manistee, Mich., in June of 1950.

Ottawa River Paper Co., Toledo, O., was constructing a corrugated box plant at Flint, Mich.

Ohio Boxboard Co. rebuilt its No. 2 machine and the contract went to Lukens Steel Co.

Scott Paper Co. was completing a new laboratory at its Marinette, Wis., plant.

Stone Container Corp., Chicago, installed a huge 95-in. corrugator and modern printing equipment.

At Ontonagan, Mich., National Container Corp. installed a new boiler.

Morris Paper Mills, of Chicago, purchased a modern plant in nearby Melrose Park, Ill., to house its Imperial Box Div., which has been in Chicago.

At Wausau, Wis., the Marathon Corp.'s new factory and warehouse was completed. Cartons, pails and dishes are made here. Fine new printing presses are part of the machinery.

The No. 3 Insulite machine at Minnesota and Ontario Paper Co. has been modernized. The new equipment gives it greater efficiency and capacity.

Up at Cloquet, Minn., the Wood Conversion Co., makers of Balsam-Wool and Nu-Wood, are operating a new chipping mill. It is a large unit with special handling for pulpwood, advanced conveyors for chips, four silos and of course, digesters and allied equipment.

BOARD IN THE SOUTH New Uses for Hardwood Macon Kraft's First Year

In the fiberboard field, one of the major developments on the continent has been the production by International Paper Co. of its new Chemfiber product. This is done by a neutral sulfite semichemical process, which was distinctly new in the South as the I.P. mills got into this field early right after the war. This has been a major factor in I.P.'s recent expansion in the container plant field all over the



TYPICAL OF PRODUCT IMPROVEMENT ALL ALONG THE LINE DURING 1949-50, was the new Kimsul made by Kimberly-Clark Carp. A well-known blanket-type of building insulation, newest version has silvery sheet of creped aluminum foil laid in with cover sheet. This foil prevents condensation and reflects heat waves away from insulation. Kimsul now also has a flap or flange on cover to make tacking and stapling easier.

country, with new container plants in cities like Los Angeles and Wooster, Ohio.

The first Chemfiber from hardwoods was made at I.P.'s Georgetown, S. C., mill, and major units are four digesters and eight Sprout-Waldron refiners. Output is 428 tons (capacity) per day, and this added up to the well over 1,070 tons of kraft boards and papers to make it the world's largest pulp and paper mill.

Chemfiber, 460 tons a day, is also a major product at the Bastrop, La., mill of International Paper, and probably makes that about the world's second biggest mill with a total of 1,360 tons a day. The Chemfiber process at Bastrop is described as using twelve digesters and one Chemipulper.

A semichemical sulfate process using Sprout-Waldron refiners is a major new enterprise at the Gaylord Container Corp. in Bogalusa, La. National Container at Big Island, Va., uses a kraft semichemical defibrator process, too, that is new.

The Mead Corp. has several neutral sulfite semichemical plants in the Tennessee region which are based on chestnut, the tannin forest that has been so widely heralded as disappearing. Rotary digesters, Sprout-Waldrons, Herman Claflin refiners, Bauer Pulpers and Shartle Hydrapulpers are used in operations that vary in detail.

The hardwoods, long a problem in the Southern woods culture, are finding increasing uses in many of the mills in the new high yield processes. And so the hardwood, along with the valued Southern pine, is finding its way into the pulp mills in increasing amounts.

One can hardly speak of paperboard or any pulpboard products without considering the South, a world's major producer and of the entire kraft paper production in the South a major portion of it is in board.

Macon Kraft Co. was a major addition in 1949, with its Beloit 216-inch Buccaneer, a Fourdrinier for modern containerboard production. One of the outstanding board developments in the nation, it will usually run at 1400 f.p.m. on 42-lb. sheet. A battery of 12 Sutherland refiners each with single 42-inch disc, prepare the pulp. J. O. Ross Engineering provided the longest and largest machine

BOARD-Continued

hood to date for the 102 dryers and 22 felt dryers.

It has been close to three years since West Virginia Pulp & Paper Co; at Charleston, S. C., doubled its production with a new Beloit all-purpose Fourdrinier machine, but paperboard is the major product, and in speaking of board developments in the South, talk still digresses frequently to this 246-inch machine and it pioneered a lot of features now often seen. A battery of Sutherland refiners precede this machine.

Also reference to the entirely new 400-Southern Paperboard Corp. mill, built by Robert Gair Co., Ltd., at Port Wentworth, Savannah, Ga., still is often heard. It has a 236-inch Pusey & Jones Fourdrinier which sometimes has gone over 500 tons a day on containerboard. It has 14 E. D. Jones & Sons Majestic jordans ahead of it.

The North Carolina Pulp Co., Plymouth, N. C., has rebuilt its No. 2 machine to make it a twin of the Beloit 550-ton machine known as "The Kraftsman." Other improvements here included Sutherland refiners with Mason-Neilan automatic control; a C-E recovery unit, Cottrell precipitator, and Allis-Chalmers lime kiln. With regard to the latter, one of the interesting trends in the southeast coast liner board mills was the movement toward longer kilns with consequent reduction of lime usage per ton. An interesting new installation at Plymouth's Kieckhefer subsidiary is one of the new drum barkers as built by the Newport News Shipbuilding pulp and paper machinery division at Newport News, Va.

The Container Corporation of America this year puts the finishing touch on its modern new plant with a new machine at Fernandina, Fla.

BOARD ON PACIFIC COAST Forest Left-Overs Find Uses; Three New Mills Built

Three significant developments in fiberboard and paperboard production on the Pacific Coast in 1949-50 were the successful startups of these entirely new operations:

The two-mill (semi-chemical and full kraft) San Joaquin division of Fibreboard Products. Inc., at East Antioch, Calif., making that company one of the "Big Three" of the paperboard industry.

The kraft pulp and containerboard mill of Weyerhaeuser Timber Co., at Springfield. Ore., marking the first time that diverse and forest products enterprise has entered pulp conversion.

The Forest Fiber Products Co., Forest Grove, Ore., built by the pioneer Stimson Lumber Co., making a wood fiber

These now are added to other complete mills built since the war, as the Simpson Logging Co.'s insulating board plant in Shelton, Wash.; the Paperboard Division of Puget Sound Pulp & Timber Co., at



IMPORTANT NEW FACTOR IN PRODUCTION of containerboard, liner und corru kraft mill of Wayerhouser Timber Co., which startedup at Springfield, Oro., in 1949. It is an important unit in a wood use center, utilizing cowmill by-products and improvements were pushing its production over 201 tens a day in 1950. This is the first Wayerhouser mill to convert its own pulp, all of it boing converted or Rice Borton paper machine.

Bellingham, Wash.; the Canadian Forest Products, Ltd., hardboard plant at New Westminster, B. C., and a small plant developing a new process on Lake Washington at Seattle. Besides this, Masonite planning its first plant in the west at Ukiah, Calif.: Potlatch Forests, Inc., is building a paper mill at Lewiston, Ida., which will be capable of making board or paper products.

The important point is that all of these are based upon whole or partial utilization of wood left-overs of woods and lumber or other processing mills which formerly had no economic value except for fuel. As a result the wood utilization on the Pacific Coast has increased in efficiency.

Meanwhile existing board mills have increased their efficiency and upped their production somewhat, including the Port Townsend mill of Crown Zellerbach; where one machine makes board and one paper: several of the Fibreboard mills; the Sydney Roofing and Paper Co., which completed a modernization program at Victoria, B. C., and going back a few years, it may be recalled that even the big Powell River Co. newsprint mill, Powell River, B. C., successfully went into laminated paper production-a heavy board sheathing-as an additional prod-

The uses of fiberboard and paperboard products on the Pacific Coast of U. S. and Canada has been greatly stimulated by the greatest increases of population anywhere on the continent. Furthermore, there is a willingness of industries, food plants, fisheries, etc., to adopt paperboard for container purposes in place of other materials, to a greater extent perhaps than is apparent in other regions. New frozen foods containers are being developed-at last reports the frozen foods packs in the states of Washington and Oregon alone, just two states, was about 50% of the entire U.S. total. Use of paper milk bottles has received tremendous impetus in the west, where political hindrances have been less conspicuous, machines being increasingly shipped to dairies. The movement of paperboard The Wallboard Industry-Insulating and Hardboards

There is a great deal of confusion in terms such as wallboard, insulating board, etc., and United Nations data and data of various gov-ernments sometimes add to it. Strictly speaking, there are two principal kinds of wallboard-insulating and hard-manufactudefibration of wood, straw, bagaine, etc. manufactured are homogenous, not laminated boards; nor they include boards to which gypsum, as-stos, etc., are added; nor do thuy include some highly porous, low-density specialties.

The wallboard industry originated in the U.S. in 1914, out of attempts to use wood waste and market a new building, easily handled, high-insulation material. It generally compete with pulp mills for supply. The big three are Minnesota & Ontario Paper Co. (Insulite); Celotex Corp. (uses bagame), and Masonite. New important plants have been built on the Pacific Coast, as related in the main article in this section.

Here are principal producing countries and

United S	tates	1,125,000
Sweden		300,000
Canada		130,660
		100,000
Norway		75,000
Western	Germany	75,000
Austria		45,000
Britain,	France, Australia-each	40,000

WORLD'S WALLBOARD PRODUCTION

	In Operation —Capacities Tone per Year 800,000	New Plants PlannedCapacities Tons Per Year 400,000
Asia	no non	15,000
North America		200,000
South America	15,000	10,000
Oceanin	65,000	25,000
	2,180,000	650,000

using factories of all kinds, especially to California, has been a major factor.

This year, British Columbia Tree Fruits, Ltd., selling agency for the Okanagan Valley orchards, experimented with a new type of handy kraft carton manufactured by Standard Paper Box, Ltd., of Los Angeles, and it is understood that application for Canadian rights to the gluing and other processes involved has been made by National Paper Box Co.,

BOARD-Continued

of Vancouver, subsidiary of Sidney Roofing & Paper Co.

The expansion of Container Corp. of America on the Pacific Coast, which began after the war with expansion of plants all along the coast, was continuing in 1950-51 apparently, as its directors approved a new machine for Los Angeles and a carton and shipping container plant at Portland, Ore. International Paper Co. has acquired a container plant in Los Angeles and there has been steady expansion in that area in containers and board in several industries. Longview Fibre started up two new corrugating plants in Los Angeles and Oakland, Calif. Longview Fibre, incidentally, is making a new product for the West-a paperboard pallet for lift truck loads.

At Springfield, Ore., one innovation in papermaking process is the three stages of Impeo vacuum pulp washing followed by rotary Trimbey acreening, then followed by a fourth washing, with wash water added on last stage flowing counter-current through screening and the first three wash stages. This permits high recoveries. Three E. D. Jones Majestic jordans, four large size Bird screens and 164 inch Rice Barton Fourdrinier with four dryer sections and Cameron winder are major units in containerboard making flow.

The hardboard plant at Forest Grove has an Asplund defibrator, two Bauer pulpers, and a Downingtown Fourdrinier ahead of a press. This is similar in these respects to the insulating board plant of Simpson Logging Co. at Shelton, where B & W rotary digesters lead off with defibrator and a Coe dryer follows the Downingtown machine. The hardboard plant at New Westminster, B. C., uses an Asplund and Bauer pulper,

But as this Review Number went to press, attention in the West was largely upon the latest of the new plants and one of the most unusual ever built by the paperboard industry-with many "first" features-the Fibreboard mills at East Antioch, Calif. Here for the first time, it is believed, a corrugating material is made from 100% coniferous wood by Asplund chemical process.

The June. 1950, issue of PULP & PAPER is being featured by a detailed article on these mills. On the semichemical side, a new .009 kraft corrugating material trademarked Tuf-Fir, 110 tons daily capacity. is made with three American defibrators, with B-K reaction chambers. Sutherland refiners and Pusey & Jones 156-inch Fourdrinier. On the standard kraft mill side. food container carton board is made from bleached pulp, 125 tons daily capacity, with 25 additional tons unbleached for other Fibreboard mills. Here logs are hydraulically barked, chips are cooked in stainless lined A. O. Smith digesters, pulp is bleached by four stage Impco process, refined by Sutherlands and made into

UNITED STATES PAPERBOARD PRODUCTION

(In Tons of 2,000 lbs.)

Container Board	Folding Boxboard	Setup Boxboard	Tube Stock	Building Boards	Other Boards	Total Paperboard	
3.434.834	1.416.452	898,549		179,443	449,796	6,379,074	
	1.711.795	996,688	164.785	1.052,054	288,424	7,969,184	
	2.015.640	829.102	307.308	1.063.851	284,963	8,588,836	
		750.313	458,107	1.067.467	322,225	8,962,568	
				894 830	1.074,368	8,913,736	
				956.358	1.380.610	9,490,174	
				1.072.372	1.541.470	10,408,981	
				1.270.348	1.645,849	10,773,407	
	2,055,471	600,730		882,395	1,810,334	9,959,129	
	Board 3,434,834 3,755,438 4,987,972 4,228,364 4,131,107 4,314,938 4,943,594 5,078,929	Board Boxboard 3,434,834 1,416,452 3,755,438 1,711,795 4,987,972 2,015,640 4,228,394 2,116,152 4,131,107 2,092,317,496 4,943,3694 2,316,691 5,078,929 2,182,354	Board Boxboard Boxboard 3,434,834 1,416,452 896,549 3,755,438 1,711,795 996,688 4,087,972 2,015,640 829,102 4,228,304 2,116,152 750,313 4,131,107 2,092,344 721,087 4,314,938 2,317,496 520,772 4,943,694 2,356,691 394,755 5,078,929 2,182,354 595,927	Board Boxboard Boxboard Stock 3,434,834 1,416,452 898,549 3,755,438 1,711,795 996,686 164,785 8,987,972 2,015,640 829,102 307,308 228,304 2,116,152 750,313 458,107 4,311,07 2,992,344 721,067 4,314,938 2,317,496 520,772 4,943,694 2,356,691 594,755 5,078,929 2,182,354 595,927	Board Boxboard Boxboard Stock Boards 3,434,834 1,416,452 898,549 179,443 3,755,438 1,711,795 996,688 164,785 1,052,054 4,087,972 2,015,640 829,102 307,308 1,063,851 4,228,304 2,116,152 750,313 458,107 1,087,467 4,131,107 2,992,344 721,067 894,83 894,83 4,314,938 2,317,496 520,772 956,358 4,943,694 2,326,691 594,755 1,072,372 5,078,992 2,182,354 595,927 1,270,348	Board Boxboard Boxboard Stock Boards Boards 3,434,834 1,416,452 898,549 179,443 449,796 3,755,438 1,711,795 996,688 164,785 1,052,054 288,424 8,087,972 2,015,640 829,102 307,308 1,063,851 244,963 4,228,304 2,116,152 750,313 458,107 1,067,467 322,225 4,131,107 2,092,344 721,087 894,830 1,074,368 1,308,010 4,943,694 2,317,496 520,772 956,358 1,380,610 4,943,694 2,326,691 394,755 1,072,372 1,541,470 5,078,929 2,182,354 59,927 1,270,348 1,645,849	

Source: American Paper and Pulp Assn.

board on a 136-in. Black Clawson cylinder machine.

Principal factors in paperboard in British Columbia are Pacific Mills, Ltd., with a variety of kraft products, liner and corrugating board; Sidney Roofing & Paper Co., with its paperboard and Powell River Co, with its heavy board sheath-

Through its subsidiary, Canadian Boxes, Lad., Pacific Mills has been producing a wide range of containers with 16 liner kraft and chip board. Several interesting new developments have occurred in this industry through the adaptation of paperboard as a packaging unit for locally manufactured machinery such as power saws and building units such as windows and door sash, the latter being made in large volume in Vancouver plywood factories. In these two items fibreboard has replaced wood as packaging material.

Experiments have been made with packaging for British Columbia fruits and vegetables and they have been notably successful with tomatoes. Two years ago when there was a serious shortage of box shooks, a quarter million cardboard boxes were manufactured for the apple crop.

Extensive changes were carried out at Sidney Roofing & Paper Co.'s board mill in Victoria, the program being completed last spring with construction of a slush stock preparation and storage plant, redesign of a machine and construction of a double machine room to house this unit.

BOARD IN EAST CANADA New Semi-Chemical Plants Paperboard Output Recovers

Canadian paperboard mills in 1949 caught up with the demand for their output for the first time since the early wartime period, and in East Canada new semichemical board mills were built or

As in the case of pulp, production of paperboard in Canada declined during the first half of the year. This was due to a slackening in demand overseas as well as in the home market, where the bulk of the mills' output is marketed. But by October most of the mills were operating at the same high levels as had prevailed during the previous year.

Several companies previously devoting most of their capacity to production of

U. S. BUILDING BOARDS PRODUCTION

				Wall- board	Insulating board
Year				(Tone)	(Tons)
1941	· ·			254,477	362,033
1943				301,333	577,473
1945				300,087	646,017
1947				301,551	770,821
1948				364,562	905,786
1949				Not	available
Source:	U. S.	Dept.	of	Commerce	(Pulp and

U. S. BUILDING BOARD (In Sq. Ft.)

		Production-
Year		Square Feet
1949		Not available
1948		3,344,000,000
1947		2,876,000,000
1945		2,742,000,000
1943		2,645,000,000
1941		2,240,000,000
1939		1,258,000,000

Source: Dept. of Commerce. 1,000 sq. ft. 12-inch board is equivalent to 750 lbs. The government statistics for "total building boards -hardboard in %-inch equivalent, laminated fiberboard in 3/16-inch equivalent, and structural insulation in 'a-inch equivalent."

U. S. PAPERBOARD AND BUILDING BOARD PRODUCTION

(U. S. Department of Commerce-Bureau of Census-in Thousands of Tons)

	Paper-	Wet Mach Board	
1946	8,396	138	956
1947	9,186	150	1,072
1948	9,369	134	1,270
1949	8,956	121	882
*Container	boards, box	boards,	cardboard and

**Shoe board, binder board and other.

pulp and newsprint have recently contrived to make fuller use of their raw materials by turning out board as well. Anglo-Canadian Pulp & Paper Mills at Quebec, for instance, has installed a board machine of Pusey & Jones design, manufactured by John Inglis Co., and the Sturgeon Falls, Ont., mill of Abitibi Power & Paper Co., formerly a newsprint operation, which is now turning out 100 tons of 12 point corrugated board daily.

With its new equipment Sturgeon Falls, using the neutral sulfite semichemical process, is able to make a profitable use of a wide range of pulpwood species; in fact, it has operated satisfactorily on 100% virgin hardwood as well as practically every type of softwood to be found in the Ontario forests. Bark and sawdust are used indiscriminately. Key machines in the new setup are six Bauer Pulpers, five Biggs digesters, a new chemical plant to produce sodium sulfate, a Southern Extract Co. chip extractor, two Herman

PACIFIC - NORTHWEST - another in a series of scenes . . . areas where Appleton Wires serve the paper industry.



THE PACIFIC-NORTHWEST . . . a backdrop of primitive grandeur brought alive by the power-giving Columbia cascading out to the blue Pacific. Here, too, midst a mingling of backwoods and metropolis, fighting fish, canneries, lumber mills and freshly irrigated agricultural wealth, you'll find the paper industry. And, practically all of these mills already know that Appleton Wires are Good Wires!





APPLETON WIRE WORKS, INC., APPLETON, WISCONSIN

O APPLETON WIRE WORKS, 1950

U. S. FROZEN FOOD PRODUCTION

(Millions of Founds)

(Vegetables, juices, eggs, specialties, mostly packed in fiber cartons and cases—others to a less degree)

Year	Pruits	Vegetables	Juices & Concentrates	Edds	Fish	Specialties	Poultry**	Meatses	TOTAL
1916-40 (Avg.) 1946 1947 1948	138 528 344 378 337	66 453 348 446	5 10 38	178 392 371 345	183 280 247 292	45 56 40	101 317 317 161 293	294 275 499 435	960 2,295 2,186 2,135

⁵⁵ Your-and stocks, no pack data compiled. Source: WESTERN CANNER & PACKER, a Miller Freeman publication affiliated with PULP & PAPER.

U. S. CANNED FOOD PACKS

(Millions of Coses)
Large Portion in Fiber Cases and Cartons

Year	Fish	Meat	Poultry	Baby Foods	Soupe	Non-Seas. Vegets.	Milk	Pruits	Seasonal Vagets.	Veget. Juices	TOTAL
1946	18	27	1	15	48	5.3	73	79	186	129	630
1947	22	21	i	13	40	54*	77	73	1479	96	342
1948	2.3	23	3	17	42	53	81	66	140	108	355
1949	25	22	3	16	41	57	66	71	146	96	542

^{*}Source: WESTERN CANNER & PACKER, a Miller Freeman publication, affiliated with PULP & PAPER

U. S. DRIED FOOD PACKS AND GLASSED FOOD PACKS*

(Thousands of Tons)

Large Portion in Fiber Cases and Cartons

Year	Fruits	Beans & Peax	E44+	Milk, odible	Vegetables	TOTAL	Glassed Foods
1946	474	1,131	63	420	27	2,145	235
1947		1,187	43	422	25	2,369	242
1948		1,134	22	447	90	2,167	207
1948		1,152	38	547	25	3,261	186

* Glassed foods in millions of cases. All packed in fiber cartons. Source: WESTERN CANNER & PACKER, a Miller Freeman publication affiliated with PULP & PAPER.

BOARD-Continued

Claffin refiners, and the product is put over a 154-in. Pusey & Jones machine installed in 1921.

Abitibi Power & Paper Co. intends to follow through with its program of even more complete wood utilization by building another new plant for the production of hardboard at its Sturgeon Falls pulp mill. Construction will be started early in May, according to announcement by President D. W. Ambridge.

Another new semichemical board plant to be constructed immediately in Eastern Canada will be at the Bathurst Power & Paper Co., Bathurst, New Brunswick, announced in the spring of 1950.

St. Regis Paper Company, New York, will build a new Canadian plant for the manufacture of Panelyte, the firm's laminated plastic board, according to C. R. Mahaney, vice-president of St. Regis. The plant will be located at St. Johns, Que., and should be ready by late fall. It will be operated by the newly formed Panelyte division of St. Regis Paper Company, Ltd. The Canadian market has been served until now by the parent company's plant at Trenton, N. J.

Production of fibreboard at Gatineau is also playing an important role in the integration of production by Canadian International Paper Co. at that point. The original idea was to utilize the waste screenings from the newsprint mill there, but this stock has been augmented through installation of grinders' and the use of sawdust from the news mill chip screens.

Versatility in the composition of fiber-

board has also made it possible for CIP to swing away from the use of spruce in that process to jackpine, and poplar and basswood and sawmill pine slabs have also gone into the stock with satisfactory results, thus making it possible to divert the spruce to the newsprint or bleached sulfite mills, for which the other species are less satisfactory.

Paperboard Market Wants Brightness-Eye-Appeal

The field of board making, like the paper divisions, can point to 1949 pulp sales analysis to prove what seemed to all the industry men to be so true. More bleached pulps were going into containers and cartons to upgrade the rightness. Practically everyone who sold his board for quality converting was out to make that quality better by furnishing a brighter board.

The demand for more eye-appeal is a sign of the times. More brightly-lit supermarkets and self-service purveyors of sundry items practically eliminate contact between the clerk and the customer. The container itself, must catch the eye of the housewife and window-dress the quality of the product. So the consumer wanted a brighter carton.

Paper Boxes Favored

Consumer acceptance tests have shown that plums in cartons outsell the bulk fruit three to one and fruit in transparent bags three to two, according to the Folding Paper Box Association of America. Even with a price increase of 12.5 cents for the boxed article, it was favored five to four over the bulk.

Consumer acceptance tests show that cauliflower in boxes outsells the bulk product at a ratio of 7.5 to 1 at the same price and by 1.4 to 1 when the former is three cents a head higher, according to the association. There is no great difference between the sale of the boxed and cellulose acetate-bagged vegetable. With refrigeration and a sprout inhibitor, which is best put in a carton or applied to the paperboard, the shelf life is extended.

FOREST FIRES have been known to overtake running deer and men on horseback

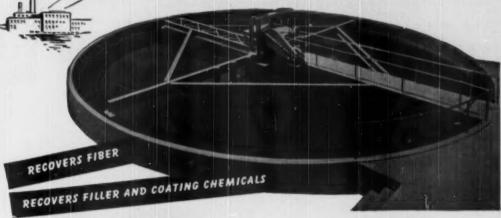
LIGHTEST WOOD in the world is believed to be tano. It is found in Siam and the Malayan Peninsula.

U. S. PAPERBOARD STATISTICS

Year-	Production (In	Imports Tons of 2,000	Exports Consumption (bs.)		er Capita umption Lbs
1899 1904 1909 1914 1919 1914 1928 1938 1938 1938 1938 1948 1948 1948 1948 1948	394, 111 \$59, 711 883, 068 1, 291, 805 1, 867, 064 2, 850, 000 4, 451, 187 4, 073, 263 8, 399, 999 8, 399, 999 10, 73, 407 9, 490, 174 10, 408, 982 10, 773, 407 9, 989, 179	44,461 55,275 42,351 20,936 28,728 36,882 54,234 51,189 42,347 60,109 75,072 70,309	61,890 48,661 94,374 51,159 113,571 141,250 86,705 159,058 179,58 179,502 170,837 145,997	394,111 559,711 883,088 1,291,605 1,649,635 2,856,614 4,399,166 4,043,038 5,940,651 8,293,592 8,693,993 10,692,589 10,677,642 8,883,441	10 . 5 13 . 6 19 . 5 26 . 4 35 . 2 25 . 5 72 . 4 63 . 9 90 . 8 125 . 7 126 . 4 126 . 2 133 . 4 142 . 9 145 . 7

Source: American Paper and Pulp Association.

In white water treatment ... THE DORRGO CLARIFLOCCULATOR



PREVENTS STREAM POLLUTION

in one operation ...

The Dorreo Clariflocculator is a two-in-one unit providing mechanical flocculation coupled with continuous sedimentation and clarification . . . all in a single compact structure. In operation, solids are continuously withdrawn from a central sludge cone and a clear effluent is overflowed peripherally across a weir extending completely around the tank.

The case history at the right is based on Dorrco Clariflocculator operation at a large Wisconsin Paper Mill. At this mill, alum is added in the papermaking step to hold pH at 4.2 for best paper machine operation. Similarly, activated silica is used in a sufficient amount for best fiber retention on the wire. Consequently, no additional flocculating reagents are necessary, although in other cases they may be required for optimum results.

Regardless of the exact nature of your white water problem, there's a good chance that the ability of the Dorreo Clariflocculator to recover flotable and non-flotable material ... simultaneously . . . may mean money in your pocket. Why not check with a Dorr engineer?

Equipment: One 30' dia. Dorreo Clariflocculator.

Feed: White water from paper mill. Solids contain 17-74% clay, starch, titania and other coating materials. Chamicol Used: Paper Makers' Alum and activated stice.

31110	Self:	h-bs./1,000		Becoming	% Salids
Yest No.	8.38 6.57	0.16 0.16	35.69 43.82	98.5 97.8 96.3	0.43 0.53 0.34
3 4	3.90 5.40	0.16	28.39 25.98	97.6	0.31 soed.

Comments: Pulp is sulphite and groundwood. Feed contains dissolved air tending to form scum but the flocculation effectively eliminates this problem and produces an excellent effluent.



THE DORR COMPANY, ENGINEERS BARRY PLACE, STAM

HEW YORK . ATLANTA . TORONTO CHICAGO . DENVER . LOS ANGELES WESTPORT, CONN.

SUGAR PROCESSING

PETREE & DORR DIVISION, STAMFORD, CONN. ASSOCIATES AND REPRESENTATIVES

RESEARCH ENGINEERING

WOOD PULP SECTION

FUTURE OUTLOOK IS FAVORABLE

Looking back over half a century of wood pulp production, the tremendous increases in worldwide production capacity—to 36,124,000 tons in 1949, according to the U. S. Pulp Producers Association—is a phenomena of a dynamic industry blessed with a raw material that can reproduce itself where given a chance and intelligent assistance.

Unlimited horizons are ahead for multiplying uses and products in paper, rayon, plastics and other fields; for refining and improving the processes, for increasing the species of trees that can be used and for greater efficiency and integration of their use.

A most significant development of the past 20 years is the shifting of the center of world pulp production from Europe to North America. Before World War II, Europe produced 8% more pulp than U. S. and Canada. Now the latter produce over twice as much as Europe. In 1949, U. S. and Canada produced 12,223,000 tons of a world total of 18,432,000 tons of chemical pulp, while North Europe's share was only 4,130,000, and all of Europe's, 5,774,000. In groundwood it was a similar story—total, 10,464,000 tons; U. S. and Canada, 6,637,000; North Europe, 1,970,000; all Europe, 3,327,000. Grand world total production, 28,896,000, compared to 29,336,000 in 1948, but greater than any previous year.

Pulp producers and marketers looked optimistically to 1950 and 1951 and the long term future. Widely regarded experts in the field see room for more pulp mills, even beyond those now under construction and being completed.

There was a soft period in 1949 for several grades of pulp, but all recovered strongly by 1950. For the first time in six years in 1949, U. S. production stopped climbing—fell back nearly 6%—but the 12,150,000 tons produced was the second bast year in history (the record—12,872,000 in 1948). Imports were off 19%; total consumption in rayon, paper, etc., reached 14,183,000, which was 5% off 1948; but capacity increased 7% to 15,210,000 tons and exports went up to 33%.

The United States is now producing and consuming twice as much wood pulp as in 1938; over ten times as much as in 1899.

Canadian production reached a new all-time record for that nation—7.542,000 tons—the third year it has totaled over seven million. This is over twice the pulp production in Canada in the mid-'30's and earlier years. But Canada's exports were down—12% in chemical, 30% in groundwood. European exports to the U. S. have declined from 794,000 tons in 1947 to 451,000 tons in 1949, the latter being a figure only about one-third of peak pre-war years. In 1949 U. S. pulp imports were 75% from Canada; 15% from Sweden; 8% from Finland.

WASHINGTON LEADS ALL STATES IN PULP OUTPUT; LOUISIANA PASSES MAINE FOR SECOND PLACE

Washington leads all the other United States in wood pulp production by a wide margin. The latest available figures, for 1947, show Washington state far ahead, making a half million tons more than any of its nearest rivals, with a total output of 1,612,000 tons.

But Louisiana has climbed over Maine to take over second place. And Florida and Georgia both have passed Wisconsin. Thus is shown the shift to more pulp production in the Far West and South, and less in East and Midwest.

The last production figures by states, which have been issued by the U. S. Census Bureau, are as follows:

PULP PRODUCTION BY LEADING STATES

Latest			1946	1947
Rank	State		Tonnage	Tonnage
1st	WASHINGTON		1,332,940	1.611,769
2nd	LOUISIANA		989,388	1,165,997
3nd	MAINE		1,185,232	1,065,292
4th	FLORIDA	The second secon	694,594	928,128
5th			422,648	890,968
6th	WISCONSIN		889,139	806,891

In another table in this section, we show the origin of "market pulp"—which is the pulp sold to all U. S. paper mills by domestic and foreign suppliers. This shows that the three Pacific Coast states alone produced virtually 30% of all this market pulp in 1949. Virtually all of this was made in Washington state, where there are now ten "market pulp" mills, including the two largest in the world, and most of these are in the sulfite field. Washington's percentage of the market pulp market has climbed from 22.6% in 1947, to 25.2% in 1948 and 29.9% for 1949.

If British Columbia were added to the Pacific Coast states, the percentage of market pulp originating in that area would certainly be close to, or more than half of the total.





PROMINENT IN PULP marketing and producing councils in the past year are (left to right): STAN-FORD G. BLANKINSHIP, of Perkins-Goodwin Co., and President of Association of American Wood Pulp Importers, who predicts a strong pulp market, and JAMES L. RITCHIE, who took over as new Executive Director of the U. S. Pulp Producers Asan., succeeding Oliver Porter, who retired to Connecticut after many years in that post.

PULP ON THE PACIFIC COAST 6 New Kraft Mills, Others Add New Trends in Equipment

Production of kraft pulp on the Pacific Coast—U. S. and Canada—has more than doubled since the early war years. Bleaching and chemi-cleaning of all kinds of pulps also has greatly increased.

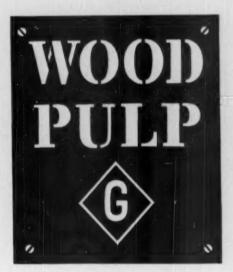
These, perhaps, are the two outstanding trends, as of today, in the pulp industry of the Pacific Coast, and the end is certainly not yet clearly in sight.

They stem, both of them, from the desire for closer utilization of wood resources in the Far West, the salvaging of wood from lumber mill leftovers and woods residue, and from the broadening of the species adapted to pulping processes, especially in the greatly increased use of Douglas fir and other fir species.

Calling the roll on the new modern kraft mills built or being actually built in the Far West is a very impressive and dramatic way of indicating what this growth in kraft pulping means.

Potlatch Forests, Inc., is "highballing' work to complete a new bleached kraft pulp and paper plant at Lewiston, Ida, by the end of this year. At Nanaimo, B. C., the prominent H. R. MacMillan Export Co. was completing its market kraft pulp mill this spring, rated 200 tons, with bleach plant planned for fall. The only woodpulp mill in California was started up this year by Fibreboard Products, Inc., at East Antioch, with 150 tons standard kraft, 125 tons bleached on one side, and 110 tons semi-chemical on the other.

Weyerhaeuser Timber Co. started its 150-ton containerboard kraft mill at Springfield, Ore., in late 1949, and this year was stepping up its production Established 1886



"Step by step, since Time began, I see the steady gain of man."

WHITTIER

Consider America's vast industrial progress in the half-century just concluded. Who can doubt greater advances in the years ahead—particularly for the Pulp and Paper industry with its myriad, ingenious products.

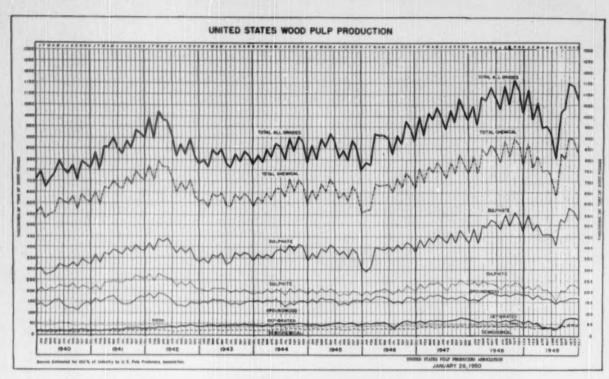
For nearly two-thirds of a century, we have participated in this unceasing development and enjoyed the friendship and goodwill of three generations of American papermakers.

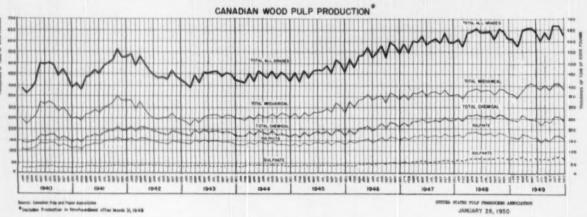
Growth is good . . . growth with friendship strengthened is even better.

GOTTESMAN & COMPANY

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PULP-Continued

slightly. In late 1948 Weyerhaeuser entered the market kraft pulp field with its 200-ton bleached kraft plant at Longview, Wash. About the same time the big Crown-Zellerbach operations at Camas, Wash., added 165 tons of kraft and a kraft bleach plant, as well, and the Bloedel, Stewart & Welch forest products firm was coming in with its market kraft pulp mill of 165 tons at Port Alberni, B. C. Substantial kraft pulp increases were being made in existing mills—at Pacific Mills, Ocean Falls. B. C.; at Longview Fibre Co., all-kraft and now the second biggest U. S. Coast paper mill; and, to a

lesser degree, at Crown's Port Townsend, Wash., mill. Now St. Regis is engaged in bringing its kraft pulp mill up to the standards set with its new paper mill in Tacoma, Wash.

In no other section of the continent outside the South has there been such an increase in kraft. This, of course, does not include two or three other Far Western kraft mills in the promotional or discussion stage: The Colorado newsprint mill of 200 tons, expected also to make kraft pulp, promoted by Columbine Development Co., headed by Preston Walker, Grand Junction, Colo., publisher, which made the successful bid March 29 for 4,500,000 cords of beetle-infested western Colorado Forest Service timber; the proposed Alberta Pulp Mills, of Red Dee,

Alta., to make kraft pulp and board, and possible others so nebulous at this stage that their mention is hardly justified.

The additions in kraft actually being built or completed total close to 400,000 tons production annually—a really formidable figure which shows what is happening on the Pacific Coast in the way of wood utilization.

Increased production by other mills is expected to offset the loss resulting from the shutdown of Sorg Pulp Co.'s kraft mill at Port Mellon, B. C., but there are indications that eastern interests will take over this plant.

This year, according to well informed estimates, should see a total production of unbleached sulfate pulp in British Co-

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GNE OF THE MOST IMPORTANT new pieces of aquipment commercially satubilished in past year in pulp memoriscuring is this Curlotor machine, introduced at Price Bros. nills in Quebec, on ingenieus instrument which preduces permanent changes in shape of pulp fibers, exerts powerful deshiving action and is a tool for altering properties of pulp to obtain higher qualities. Made by Curloter Corp. of Rochoster 10, H.Y.

U. S. PULP IMPORTS

Year	Chemical Tone	Pulp Value	Ground- wood Tues	Value
1949	1,547,453	\$164,910,931	214,235	\$12,099,373
1948	1,882,140	\$253,785,415	282.970	\$18,459,962
1947	2,016,153	\$234,126,318	290,514	\$18,032,673
1946	1,549,342	\$124,210,220	245,327	\$11,190,850
1945	1,526,647	\$106,858,690	227,418	\$ 8,936,177
1940	1.053.057	855,474,094	170.909	\$ 4,712,649
1939	1,796,673	870,680,333	227.954	\$ 5,218,752
1938	1,551,254	869,171,748	170,470	\$ 3,592,369
1937	2,176,183	593,926,745	218,422	\$ 4.342,168
1936	2.049.723	878.785.004		8 4 051 224
1930	1,530,965			\$ 7,146,290
1925	1 332 523	\$73,317,337	131 092	\$ 8.517,114
	e: U. S. Pu	ip Producers		

U. S. WOOD PULP EXPORTS

	Tons	Value
1949	120,958	\$13.930.799
1948	93,782	\$13,224,370
1947	130,096	\$18,866,564
1946	39.361	\$ 3,645,963
1945	135,997	\$ 9,735,738
1944	218,401	\$15,518,264
1943	300,700	\$20,288,879
1942	378,148	\$24.030.443
1941	328,608	\$21,292,880
1940	480,938	\$29,736,737
1939	139,504	\$ 6,493,140
1935	171,710	\$ 8,632,971
1930	48,426	\$ 2,070,553
		of Commerce and
U. S. Pulp Prod		

TOTAL UNITED STATES PRODUCTION OF WOOD PULP

Year	Total	Unblesched Suinte	Tens of 2000 ; Bleached Sulfite	Pounds) Total Sulfate	Groundwood	Soda	All Other
1925 1930 1930 1931 1937 1938 1938 1939 1940 1941 1942 1943 1944 1944 1944 1946 1947 1947 1948	10,606,527 11,945,864 12,672,292	790, S10 815, 897 634, 947 693, 903, 791, 575 601, 855 729, 203, 995, 700 1, 215, 649 1, 213, 066 863, 306 862, 928 815, 969 784, 391 894, 107 901, 814 710, 486	612 S76 731 166 944 620 1 127 939 1 346 669 1 004 621 1 217 249 1 612 089 1 703 131 1 717 206 1 553 221 1 543 762 1 692 077 1 901 945 1 909 402	409,768 949,513 1,867,749 1,794,734 2,139,087 2,443,051 2,002,657 3,747,992 4,526,611 4,738,664 4,235,724 4,548,810 4,571,875 4,588,016 6,135,671	1,612,019 1,560,221 1,355,819 1,355,819 1,475,620 1,600,667 1,333,308 1,444,875 1,632,727 1,685,808 1,669,862 1,766,752 1,769,287 1,855,608 1,951,456 2,049,814 2,175,107	472,647 474,230 417,724 478,502 507,548 395,307 441,565 532,387 479,935 462,065 418,868 412,755 479,757 476,211 491,580 509,864	64,697 79,281 104,810 124,521 185,372 155,418 197,785 438,664 544,288 782,965 822,616 991,442 1,079,087 1,114,376 1,251,798

Bource: U. B. Bureau of the Census.

Note: Through 1939, "exploded" wood pulp is included in Groundwood and thereafter in "All Uther."

1933 through 1936 data on Soda are estimated from United States Bureau of the Census combined data for Soda and Bemichemical pulp.

PULP-Continued

lumbia amounting to 83,500 tons; of bleached sulfate pulp of 30,000 tons.

This is kraft only-and does not take into account the alpha sulfite cellulose pulp mill of 235 tons, to be completed by 1951 by Columbia Cellulose Co. (Celanese Corp. of America) at Watson Island, B. C., (with plans for a second unit; the groundwood mill planned by Idaho-Montana Pulp & Paper Co. at Polson, Mont., for which some \$2,000,000 raised has been registered with the SEC the sulfite dissolving pulp mill planned at Dun-can Bay, B. C., by Canadian Western Lumber Co.; the newsprint mill for Sweezey interests at Edmonton, Alberta; and the virtual assurance that, if the Bowater's interests of Canada and England build another mill, it will be in British Columbia. The first two had at one time been planned as kraft mills, but are not now. Engineering for the sulfite mill at Ketchikan, Alaska, to be built jointly by Puget Sound Pulp & Timber Co. and American Viscose, is "marking time," but

under terms of the Forest Service timber sale, the beginning of construction was called for this summer.

Most of the additional bleaching in the Far West has been in kraft, of course, as it has in other regions. But there is a new Becco process of bleaching groundwood at Westminster Paper Co., New Westminster, B. C., and what has been historically and prominently the biggest unbleached sulfite pulp mill in the world—Puget Sound Pulp & Timber Co.—started up a new 2-stage chemi-cleaning plant in April of 1950.

One of the most common remarks heard in summing up the past year for the Pacific Coast pulp industry is that it experienced a slump in mid-1949. It is true that in unbleached markets there was an ebb-tide, and a freakish shift in women's styles in the rayon textile fields was held largely responsible for a soft period for some dissolving pulps, but in the face of these symptoms, the bleached sulfite market for Coast mills was the biggest in history.

Soundview Pulp Co. made 200,725 tons of bleached sulfite pulp in 1949—the most sulfite pulp ever made by one mill in the

entire history of the industry, practically all of which was for the U. S. market. Weyerhaeuser Timber Co. had a big year, too—exceeding 101,000 tons from its Everett mill and 190,000 tons from its Longview sulfite mill.

There have not been any really important new pulp products from the West except the chemi-clean pulp now being shipped from Bellingham. Soundview is still fundamentally the greatest paper pulp supplier and can make over 600 tons a day under best conditions. It makes a small amount of special pulps for lacquers, cellulose nitrate products, etc., but is not really anything very new as it was a big nitrating pulp producer for the army smokeless powder in the war. Of course, back in January of 1949, Weyerhaeuser came out with its new market bleached quality kraft, which is distributed to the same general markets as its bleached sulfite pulp. Paper alpha and dissolving pulps in rayon and cellophane are being manufactured in small quantities at the Weyerhaeuser Everett mill. Rayonier and British Columbia Pulp & Paper are, of course, the principal dissolving pulp producers, as they have been for years.

New Equipment

In the line of new equipment and processes, the most important changes taking place on the Pacific Coast are those involved in the magnesia base and amonia base cooking processes. More than anything else, this has stimulated development of new stainless steel and other alloys and corrosion-resistant materials. These developments are still going on in foundries and fabricating plants that are important in the pulp picture.

In our November, 1948, issue we described the Weyerhaeuser Mg0 plant at Longview, Wash., with its numerous new concrete and steel structures, maze of stainless tubing, and new elaborate automatically controlled equipment never before seen in the pulp industry. A Babcock & Wilcox extended type recovery furnace, in contrast to the traditional kraft vertical type; ahead of burning the distinctly new General America type completely stainless evaporator for neutralized liquor; the horizontal steel dump tanks, cooling towers and absorption towers are among the most striking new equipment to be seen. B & W is exclusive licensing agent for this process.

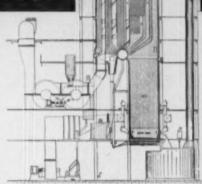
Stebbins Engineering has developed a new type of acid proof cement linings for the new soluble base sulfite cooking systems-Mg0 and ammonia are both in use in the West. This lining eliminates the use of litharge formerly used in acid base systems. An improved type of brick is used. too. Also for the soluble base systems, the washing of liquor is done on vacuum washers for recovery, instead of in the blowpits. Also previously described in PULP & PAPER were the basic steps at the ammonia sulfite plant of Rayonier's at Shelton, Wash., by liquor is disposed of by burning. Now Soundview Pulp Co. and Crown Zellerbach Corp. are jointly



In the middle of January, three months ahead of schedule, newsprint made from southern pine began rolling out of the \$32,000,000 Coosa River Newsprint Company Plant in Alabama. It is the second such plant to be built in the South, and the first in more than a decade. Pine from the river valleys about this area — forty miles southeast of Birmingham — will be used. The mill is expected to turn out 350 tons of newsprint daily, and in addition will produce more than 146 tons a day of dried fully bleached kraft pulp for the facial tissue and creped wadding plants of the Kimberly-Clark Corporation.

The mill is equipped with a C-E Recovery Unit (shown at right), designed to burn 750,000 pounds of black liquor solids per 24 hours and will produce steam at 590 psi and 730 F.

The reliability, economy and operating efficiency of the C-E Recovery Unit have been service-proved in



Sectional elevation of C-E Recovery Unit

pulp mills all over the country. The choice of a C-E Unit by Coosa River Newsprint Company is just another example of the wide acceptance of Combustion Engineering—Superheater equipment in this field.

COMBUSTION ENGINEERING— SUPERHEATER, INC.

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PROBUCTS FOR THE PAPER INDUSTRY INCLUDE RECOVERY UNITS, STEAM GENERATING, FUEL DUPNING AND RELATED EQUIPMENT: ALSO PRESSURE VESSELS

1950 Review Number

PULP & PAPER

91

CONSUMPTION OF WASTE FIBROUS MATERIALS BY U.S. MILLS

	(in Waste Paper	Thousands Rage	Straw, Flax and Other	Total
1939	4,366	468	691	5.526
1944	6.859	428	917	8.245
1945	6.800	414	929	8.143
1946	7.278	463	980	8.660
1947	8.009	462	3.064	0.535
1948	7.649	435	1.075	9.149
1949*	4.553	383	837	7.763
* Prolic	DINATY.	Source: Pul	s and Paper	Sec., Fores
Products	Div. Off	ice of Dome	rtic Commer	

PULP-Continued

financing an experiment in ammonia sulfite cooking at the C-Z Lebanon, Ore., mill where an attempt will be made to develop practical means of recovery, as well, and a pilot plant evaporator has been purchased and other equipment. The project should be in its initial stages of operation somewhat before Sept. 1, 1950.

Indicative of trends that may be expected in sulfite waste liquor plants, the Puget Sound plant at Bellingham used stainless clad for collecting waste liquor for steam stripping of the sulfur dioxide before sending the liquor to its alcohol plant. They replaced wooden tanks, the liquor being too hot for them. Solid sheet stainless tanks also have been made for acid tanks, with structural steel supports.

New stainless steel and Inconel and carbon brick linings for the kraft industry have been developed, replacing the old mild steel digesters so well known in the past in this field. This is due to the kraft process getting over more on the acid stde, and in the Pacific Coast mills the rate of corrosion due to the acids in Douglas fir and other fir species now being used is greater than was the case with hemlock. A. O. Smith Corp. is now supplying four new digesters to St. Regis Paper Co., Tacoma, Wash., and, as in one for Crown Z at Port Townsend, Inconel linings are used for the first time in tops and upper cone because tests showed its resistance to corrosion is better than stainless above the chip line.

Kraft dissolving pulp has not yet been successfully made as a continuous process, and it was only made a short time during the war in any quantity, for the military. But like the South, the Far Western kraft field technicians are imbued with confidence. They point to the high tear quality of Douglas fir kraft and to the five and six-stage bleach plants now introduced in the Pacific Coast, achieving 85 brightness.

The Impco six-stage continuous bleach plant at Caman; the five-stage batch type plant at Weyerhaeuser's mill in Longview—both for kraft—have many new features too numerous to outline here, but significant is the push button control, the ability to by-pass and combine different stages as desired, and the openness and visibility. High density storage of pulp has increased manyfold in the west, and this has permitted increased storage of pulp and versatility of operation.

The hydraulic whole log barking and whole log chipping continue to be outstanding engineering features of western pulp mills and nearly all of them now U. S. WOOD PULP PRODUCTION BY REGIONS - 1949

(All grades except Defibrated and Exploded Wood Pulp)

(In tons of 2,000 pounds, sir dry weight)

	New Eng.	Wid. Atl.	Lake	Pacific	South	Total
Sulphite	490.557	287,366	578,980		72,909*	2.537.612
Bleeched	356,920	189,861	476,282		51,619*	1,856,732
Unbleeched	159,437	97,508	102,648	341,290	0	700,880
Sulphate	16	6.281	255,167	558,841	5,067,964	6,016,373
Bleached		2,733	55,256	186,022	965,621	1,127,631
Semiblesched		0	58,751	56,056	179,664	274,471
Unbleached	81	8,648	189,161	366,763	4,024,699	4,614,271
Soda	142,785	155,915	52,331		27,097	476,126
	Tar bion	AUUSTAU	or loop		. , ,	
Semichemical/			00 040		61,619	442,459
Chemifibre	0	0	80,840			
Graindwood	549,405	261,924	385,790	377,635	385,803	1,958,557
Sereenings/Off						
Quelity	2	7,191	80,873	24,656	55,516	115,556
Total	1,261,539	795,785	1,859,481	2,078,526	6,051,554	11,546,663

* Includes one Southern mill.

Source: As reported to United States Pulp Producers Association, Inc. by companies representing 98 % of the above production and estimated for 2 % of the above production.

have these systems which save up to 20% of wood supply and much hand labor.

Newest development in this field is the Hansel ring type barkers made for Bloedel and Weyerhaeuser mills and now being made for Potlatch Forests, which have astonishing economy in water conservation because of a micarta strip packing. Essentially, the machine consists of a rotor, which carries four nozzles equally spaced at opposite ends of the ring through which the logs pass but to butt, and which rotates between micarta strip seals in a stationary member to which water up to 1500 psi. can be supplied. Hydraulic pressure behind the strip holds it close to rotating parts.

The Howard Simons hydraulic barker going into the MacMillan mill at Nanaimo and Canadian White Pine has a novel approach, with pipe forking into two arms with nozzles in the end, which rotate at high speed. One arm barks half a log on each side. It has high efficiency even without the nozzle perpendicular to, or above the log, as in others of the type.

The versatile, cradle type barker introduced at Bellingham, Wash., by Puget Sound Pulp & Timber Co., with log revolving on toothed wheels on two shafts which cradle the log, has proved popular and Sumner Iron Works installed this type in Crown Z's new wood room at Camas and other mills. Worthington developed a somewhat similar barker and installed them this year at Spaulding and Inland Empire mills on the Pacific Coast.

The barkers have reduced supply of hogged fuel. Most pulp mills in the Far West can still get hogged fuel most of the time; when they can't, they burn oil and Fibreboard at Port Angeles was one that put in oil burners. But many observers believe the handwriting is on the wall, and gradually present fuels will be in shorter supply and the industry is faced with need of more efficient power-houses. Longview Fibre's new power and recovery plant which started up last year, with more efficient combustion and reasonable cost, is a case in point.

PULP IN THE SOUTH Eyes On Natchez; Coosa River; New Trends in Digesters

Since equipment became available coincident with the close of the war, the picture of pulp production in the Southern branch of the industry has done everything but stand still. The replacement of older machinery with modern equipment has continued without let-up. This progress has been noted in older mills, and, of course, in the newer mills that went into production or were virtually at the brink of operation at the close of the year.

There has been an expanding interest in more and better bleaching; and in modern equipment for washing stock. Installation of modern, closed systems for stock washing have maintained their place in mill interest, stemming not only for control of water in the closed system and better results but also in control of mill effluent. The interest in stream improvement is increasingly evident and in many states the pulp mills are out in front in this respect. Electronic control of washers has entered the Southern field.

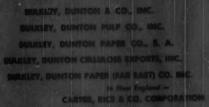
The Coosa River Newsprint Co., near Childersburg, Ala., started to produce high quality pulp for the Kimberly-Clark kleenex plant at Memphis, Tenn., late in 1949. The Neenah, Wis., company draws upon this pulp under stock ownership and mill management contract. The pulp here is processed under a dual set-up with the shipping stock going through a 6-stage bleaching installation and that for newsprint through a 3-stage, both Impeo bleaching installations.

At Coosa River, the pulp division has capacities for 146 tons of fully bleached kraft for shipping, 74 of semi-bleached kraft for newsprint, and 294 tons for groundwood for newsprint. The six digesters were provided by A. O. Smith Corp., with four alloy and two carbon-steel lined. Five Appleton Machine grinders are the key unit in groundwood.

Probably no pulp mill ever built in the

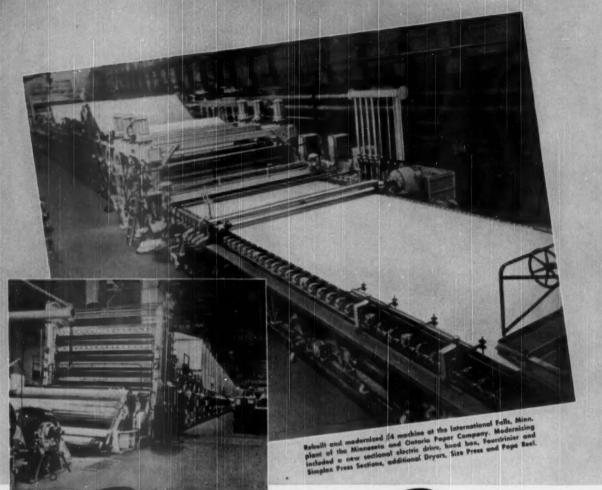


Pomestic Export



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A machine modernization program may call for the addition of a new appliance, the replacement of an obsolete drive, or may involve the complete rebuilding of the machine itself.

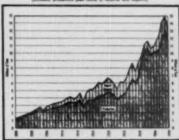
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HEW SUPPLY OF WOOD PULP OF THE UNITED STATES



PULP-Continued

South is of such transcendent interest to all phases of the interest in North America as is the one being completed in mid-1950. At Natchez, Miss., the hardwood kraft pulp mill of International Paper's Southern Kraft Division, which is designed to make dissolving rayontype pulp for market, but could also make paper pulp, of course. It will use mostly sapgum. It has eight of the largest digesters ever made for kraft, 60x13 ft. diameter, supplied by A. O. Smith and portending a trend toward larger digesters. Esco circulation and new design of stainless relief condenser by Esco, and A. O. Smith's unique cones of 6 ft. 6 in. radius, are unusual features.

The Chemfibre mills of International at Georgetown, S. C., and Bastrop, La., led the trend in the South for greater hardwoods usage, but these mills for coarse fiber were pretty much in production soon after the war, and now the higher qualities of pulps are the new goal.

In Mobile, Ala., Hollingsworth & Whitney Co., started its pulp mill expansion during the year with the objective of 50% increase in capacity. The provision for an increased water supply came first, with installation of recovery furnace and other features following. The mill here is providing a doubled bleaching capacity.

Improvement and enlargement of the bleaching plant was also effected by Gulf States Paper Corp., at Tuscaloosa, Ala., where a third machine went into production at the close of 1948, Work continued into 1949 as this mill covered the screen room and final wind-up of the modern washer installation.

In these two mills, as well as elsewhere in the South, recovery of chemicals through installation of precipitators was effected. As predicted some time ago, precipitators have become standard equipment of mills of sufficient size to justify them economically.

New recovery boilers have been installed in many mills. At such places as Brown Paper Mills (Monroe, La.), Gulf States Paper Corp. (Tuscaloosa, Ala.), and Calcasieu Paper Mill (Elizabeth, La.), these modern units displaced original installations made years ago when this type of equipment was recently in the market. In the case of Crossett Paper

U. S. PULP IMPORTS FROM EUROPE AFTER POSTWAR SHIPPING RESUMED

	Sweden	Finland	Norway		Austria	Italy	Dunmark	Casch	Total
1945 (6 mos.)	445,114	115,220	9. 577						672,261 500,334
1947 1948 1949	535,213 584,578 266 884	223,973 175,900 149,155	13,216	4,928	1,696	336	156	973	793,693 575,390 450,679
lot 3 Months 1950	168,359	84,574	11,620	2,079	6,697	356	168	333	254 075

U. S. IMPORTS OF EUROPEAN WOOD PULP

When had Said a

(In Short Tons)

	-	1400		Sulfate			51	
	Paper Graduo		Unbhached Sulfite	Bleached	Unhl.	Ground	inds	Total
1946. 1947. 1948. 1959 1st 3 Montha Source: Department of C	74,992 91,039 36,941	4,547 4,648	207, 1839 293, 1986 221, 033 134, 573 74, 208	31,484 64,103 65,967 68,880 24,655	260 ,434 324 ,548 186 ,662 130 ,869 97 ,805	29 399 29 434 16 197 19 294 15 422	1,477	560,334 793,693 575,390 450,679 254,075

U. S. IMPORTS OF NORTH AMERICAN WOOD PULP

(in Short Tons)

	Hisache:	d Suitte		9	Hate			
	Paper	Non-Paper	Unbleached -	30	Irain			
1946 1947 1948 1949 1950 lat 3	Grades 195,112 229,771 247,838 241,551	Cirados 1.89 .773 234 .883 224 .943 149 .801	Sulfite 411,512 438,553 453,674 256,993	Bisached 56,213 174,866 217,022 323,212	Unbleached 137,472 145,626 249,787 117,917	Groundwood 220,823 279,512 274,787 189,804	50:d% 19.740 31,203 24.843 27,315	Total ⁶ 1,245,131 1,528,767 1,600,721 1,314,183
Months	69.508 ludes screeni	49,306 ngs. Source	68,104 Departmen	of Commi	28 ,845	32,912	8,232	367,812

Mill (Crossett, Ark.) the interior of the recovery building has been given a glazed non-dust catching surface. This constitutes something new.

Stebbins Engineering and A. O. Smith Corp. have both been pioneering in the new trends in the South away from the old style mild steel digesters. As many of the kraft mills are trending over to the acid side with pre-hydrolysis of wood and the up-grading of product, the mild steel is no longer satisfactory. Carbon linings by Stebbins in some of the biggest kraft mills of the South, on the east coast, and A. O. Smith alloy and carbonsteel lined digesters are at Coosa River, for example.

Automatic instrument control for cooking made substantial gains in the Southern industry during the year, with a number of new mills going that way. Macon Kraft Corp. (Macon, Ga.) came in with a new cone-bottom type digester. The installation of equipment for drawing off turpene is now standard in the slash pine-long leaf pine sections.

In comparing pulp mills of a quarter century ago with current installations the most outstanding example to be found as of date (but not for long) is that at Calcasieu Paper Mill (Elizabeth, La.) where a strictly modern mill has been erected alongside and adjoining the older 25-year established unit.

The completed re-built hardwood pulp mill at Sonoco Products (Hartsville, S. C.) resembles not in the slightest the original installation.

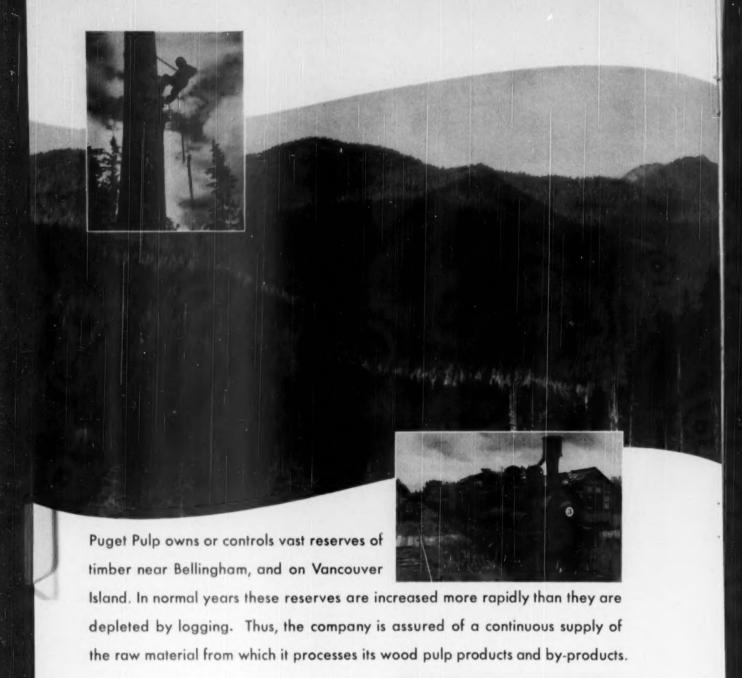
PULP IN NORTHEAST The Syracuse Discovery; The New York Market

Rapidly progressing steps to increase use of hardwoods of the Northeast states in pulp was a major development of this region in 1949-50. Otherwise, pulp operation improvements in the Northeast were scattered and few, and in connection with

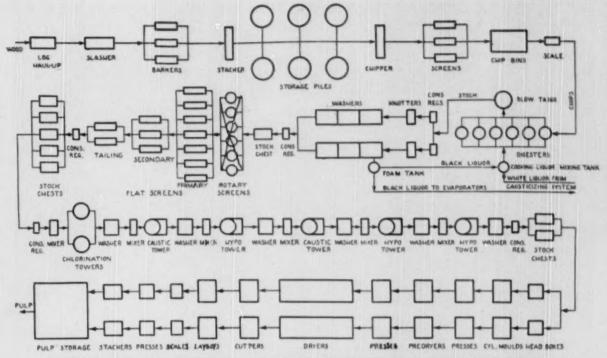
paper mill renovations like those at S. D. Warren Co., at Oxford Paper, both in Maine, or like New York & Penn in Pennsylvania, where the Lock Haven mill underwent revolutionary changes, and the Johnsonburg mill installed a C-E 15-ton soda recovery unit to replace a rotary furnace.

As for new equipment design and recovery in the Northeast there seemed to be nothing introduced that was as basic as the Curlator process revealed in 1948. Yet some of the 1950 ideas were only half out of experimental stages on pulping and could be important factors. Among them: The Stacomizer, developed by a Long Island machine builder, had shown remarkable ability to dry and process bark, and its experiments on wood chips was worth watching; the Ultrasonic organization, itself in the New England area, claimed to be successfully preventing air pollution by sound waves but do not as yet reveal the mill.

The first successful commercial method of making good cheap paper pulp from hardwoods by a chemigroundwood process was announced in February of 1950 by the New York State College of Forestry, Syracuse, N. Y., and St. Regis and other companies were taking an active interest in the new development. Prof. C. Earl Libbey directed the work. Aspen, birch, beech and maple in 4-foot logs were given a mild cook in neutral sulfite liquor in ratio of 6 to 1-sodium sulfite to sodium bicarbonate. This was followed by defibering in a conventional wood pulp grinder, after 16 hours' storage, which makes grinding go faster. Fibers and vessels of pulps are completely separated and unbroken; missing are clumps and broken fibers common in mechanical pulps. Bleaching is declared easy after this process, if more brightness is desired. Hardwoods yield 25% more pulp per cord than conventional spruce, the



PUGET SOUND
PULP & TIMBER COMPANY



HERE'S THE FLOW SHEET OF ONE OF MOST CAREFULLY PLANNED AND ELASORATELY ENGINEERED PULP MILLS BUILT IN NORTH AMERICA—the Long Loc Pulp & Paper Co.'s 300-ton blooched kraft pulp mill which started up full production early in 1949 at Terrace Boy, Ont., a madel town bewn out of the wilderness on the north share of Lake Superior. PULP & PAPER additors visited remote site when this Kimberly-Clark subsidiary was first started in 1947 and again when completed.

PULP-Continued

chemigroundwood process under \$40 per ton cost includes steam, chemicals and labor expenses not encountered with spruce groundwood pulping. Chemicals can be reused at least 75 times. Products—newsprint, tissue, book, wrap, writing, building papers, board, etc.

Here may be the process that will stopgap the removal of Northeast mills to other parts of the country to be closer to pulpwood supplies.

Industrial sponsors of the research and partly responsible for the discovery is the Empire State Paper Research Associates, Inc., composed of mills of New York, Maine, Wisconsin and Canada: Oswego Falls Corp., Fulton, N. Y.; St. Regis Paper Co., New York City; Berst-Forster-Dixfield Co. (Div. of Diamond Match Co.), Plattsburg, N. Y.; Howard Smith Paper Co., Cornwall, Ont.; Ontario Paper Co., Thorold, Ont.; Hollingsworth & Whitney Co., Waterville, Me.; Scott Paper Co., Chester, Pa.; New York and Pennsylvania Co., Lockhaven, Pa.; National Gypsum Co., Buffalo, N. Y.; Moyer & Pratt, Inc., Lyons Falls, N. Y.; Sonoco Wood Products Co., Hartsville, S. C.; Northern Paper Mills, Green Bay, Wis. President of ESPRA is Harry Gray, manager of Oswego Falls Corp., Sealright Co., Fulton, N. Y.

1949 REGIONAL PERCENTAGES OF U.S. WOOD PULP PRODUCTION

(All grades except defibrated and expladed Pulp)

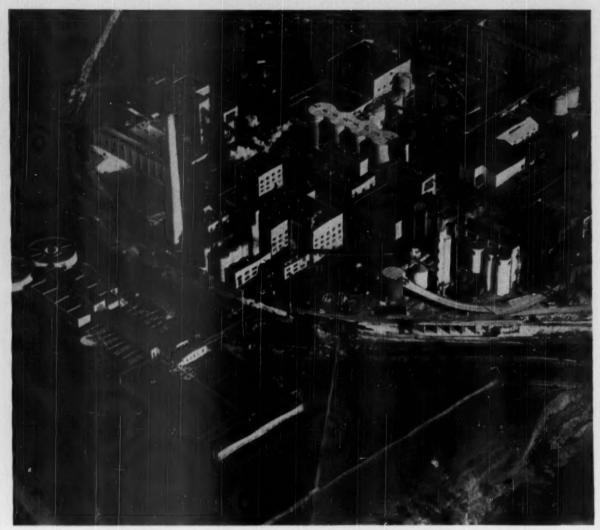
	New End.		Mid.	Lake	Paci	Be .	South
Bulfite	H3 %		11%	23 %	-	46*	(D)
Bleached 1 Unbleached 1 Bulfate	13	3	10 1/2	26 14 14 4	48 14	45	84
Bleached Semibleached Unbleached		63	4	5 14 3	12 20 1		76 % 65 % 87
Sods	10		32	11		-27	-
Chemifibre	0		0	18	_	-82	
Groundwood, Screenings/ Off			1336	1955	19		20
Quality	-	24	-	26	21		29
Total	12		7	12	16		52

* Includes one Southern mill, rest Pac. Coast. Source U. S. Pulp Producers Assa.

In discussing pulp "in the Northeast" it must be recognized that the marketing of pulp from world-wide sources is mainly centered in New York City. Here most pulp is bought and sold. In the winter of 1949-50, talk in New York was that the Swedes would be in a position to ship sizable tonnages again and that (1) they were not going to drop the prices; and (2) they would drop them some, maybe considerable. Long before the second quarter of 1950 the rumors had begun to rage and devaluation heightened the illusion. Two months befor Christmas the U.S. pulp industry had in meeting assembled decided upon a very remarkable program, perhaps one of the most remarkable approaches to an international competitive problem ever attempted by an industry. Instead of voicing fears of a wave of foreign pulp, perhaps at prices lower than U.S., and instead of expressing the fear in scolding, pulp men from all over the country decided to cast up the North American situation and make a prediction, too, as to what might be expected from Scandinavia in the way of quantity and price. Nobody said it was also a suggestion to countries abroad, and few in Sweden could tell you (or would) whether the outcome was acceptance of suggestion or happenstance or independent decision. Of course the Swedish industry journals had been predicting all along there would be pulp for the U.S. market, but not how much or what price.

It began to look a little as if some foreign pulp would firm up the market. It was in late fall that L. Keville Larson, sales manager of Weyerhaeuser Pulp Sales Division, delivered his brief but factual talk before a meeting of Morris Dowbrow's Writing Paper Association. Copies of the paper were in immediate demand but the essence of Mr. Larson's picture of the situation was already on the Swedish News Service wire and many an importer was crackling a cablegram eastward.

It was quite some time before the whole industry got the impression of power behind the straight objective and statistical news and prophecy. Since the



DESCRIPTION OF NEW WEYERHAEUSER TIMBER CO. BUILDINGS AT LONGVIEW, WASH.

Progress in the Pulp Industry might be the title for this picture showing Pulp Division of Weyerhaueuer Timber Co. at Longview, Wash. Nothing has aroused more interest or discussion in the sulfite industry than new magnesia base recovery system shown here. The MgO acid plant first started up in August, 1949, for a few weeks, then shut down for alterations. The complete cycle was first operated in November, 1949. Now—less than two years later—plans are going forward for a second commercial installation of the system.

Here also is shown a new market kraft pulp mill built by Weyerhaeuser which started up on November 5, 1948.

To grasp significance of this picture it should

be noted that the small group of buildings at right center—the sulfite pulp mill—was all that existed before this expansion began. This extensive construction symbolizes permanency of the great Weyerhaeuser wood-use center at Longview, based on integrated utilization of all kinds of wood for pulp, plywood, lumber, bark products, etc.

Lower left-Infilco water treatment plant. Left center-high stack is kraft precipitator exhaust.

Buildings behind it—lime kiln building, liquor department and kraft digester house. Nearby and to right of high stack—MgO absorption and fortification towers, acid makeup and sulfur burner. Larger buildings nearby and to right—high square-topped one is Babcock & Wilcox kraft recovery, next to it on right, lower, B & W sulfite recovery with joint turbine room. To right of these—General American evaporators for both sulfite and kraft in one building; chip storage and the unusual sulfite dump-and-wash building (digesters are not blown).

Large building at top center—sulfate 5-stage kraft bleach plant; with screen room in lower building this way.

Top right corner—long building houses Rice Barton kraft pulp machine. Long tube crossing over it carries chips from sawmills and hydraulic barking plants. One one side of tube is office (low building) and this side is machine shop and warehouse.

PULP-Continued

war the United States had become the controlling nation in the great world pulp market.

As this issue goes to press, Stanley Blankinship, veep of Perkins-Goodwin

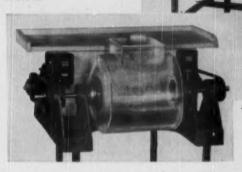
Co. and president of the American Importers, told PULF & PAFER he would stay by his statement to which the reader may refer in the April issue. Prices would stay firm for 1950; supply would be tight, perhaps a little tighter yet, and the shipments would be around 400,000 tons, about enough to help the domestic producers hold steady.

It had been a most successful and sensible holding of hands across the sea. It was a major victory for the U. S. pulp men in their new and unaccustomed role, and a credit to the Scandinavians. But they now looked at the resilience of the Administration to foreign imports. Anything could happen in this world, from forces beyond industry control and that





- * Evaluate Waste Paper and Pulp
- * Recognize Wet Strength
- * Determine Shrinkage in Waste Paper
- * Establish Dirt Count on Pulp
- * Match Colors (two minutes)
- * Test Mixtures of Stock



- Model 3 SP Stainless Steel Laboratory DynoPulper. Can
- Model 3 Laboratory Dyno-Pulper with Plexiglass Vat.

THE DynoPulper uses two opposed Dyno-Pellers (described below) in a cylindrical horizontal vat. The revolving

DynoPellers quickly disintegrate the stock and completely separate each fibre from its neighbor.

With the Laboratory DynoPulper you can perform many experiments at law cost. Results may be readily duplicated on production machines in mill operation.

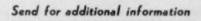
DYNOMIZING the stock in the DynoPulper may be accomplished by several different methods

depending on the kind of stock being processed. Cold water, hot water and steam pressure may be used separately or in various combinations to efficiently disintegrate every type of stock including wet strength papers . . . and with sparing use of chemicals.

Dynomized fibres are strong and free, and the original fibre length is maintained. The fibres are ideally prepared for de-inking.

The DynoPeller

is the heart of all DynoMachines. Its concave face is lined with rough, hard carbide particles. As the Dyno-Peller rotates it causes a suction at its center that pulls the stock towards it. Centrifugal force then causes the stock to flow rapidly over the rough carbide particles. This effective dynamizing action completely disintegrates the stock . . . separating each fibre from its neighbor while maintaining its original length.





RECORD OF TYPICAL PULP PRICES IN THE UNITED STATES

1	Domestic Bleached Kraft	Norwegian Riesched Sultire	Swedish Eleached Suillie	Dumostic Bleached Suifice	Swedish Unbleached Sulfite	Swedish Unblesched Kraft	Canadian Bieschod Sulfire	Canadian Bleached Kraft	Canadian Unbleached Sulfite
*1939 **1944 ***1946	High Low	11000	High Low \$60.00 \$43.00 (Det.) (Dock) \$60.00 \$82.60	High Low \$50.00 \$50.00 \$86.00 Del.	High Low \$50.00 \$38.00 (Del.) (Dock) \$74.00 \$70.00	High Low 842.50 \$28.00 (Del.) (Dock) \$73.90 \$59.00 82.80 79.00	\$86.00 Del. 94.00 Del.	11772 - 17774 11772 - 17774 11774 - 17774	\$74.00 Del. 82.00 Del.
1947 April, 1948.	\$155.00		High Low \$186.00 \$120.00 \$195.00 \$185.00	High Low \$135.00 \$115.00 105.00 126.00	High Low \$155.00 \$95.00 157.00 140.00	High Low \$150.00 \$90.00 135.00 147.50	High Low \$190.00 \$135.00	High Low \$195.00 \$150.00	\$126.00 Del.
April, 1949. April, 1950.	\$136.00 \$130.00 (Del.) (Del.) \$118.00 \$126.00 (Del.) (Del.)	\$125.00 (Dock) \$115.00 (Dock)	(Dock) (Dock) \$132.50 (Dock) \$115.00 (Dock)	(f.a.b. setil) (Del.) \$130.00 \$126.00 (Del.) \$118.00 \$123.00 (Del.)	(Dock) (Dock) \$122.50 (Dock) \$93.00 \$102.00 (Dock) (Del.)	(Dock) (Dock) \$112.50 (Dock) \$85.00 (Del.)	(Del.) (Del.) \$130.00 (Del.) \$118.00 (Del.)	(Del.) (Del.) \$136.00 (Del.) \$136.00 (Del.)	\$118.00 Det. \$100.00 (Det.)

Bleached sulfite gulp was priced at \$50 in the late 1920's but then took deep dips in the 1930's—as low at \$35, which was a serious threat to the continued existence of a U.S. In-

ery.

** Regarding 1939 priced, these prices are considered representative, but it is difficult to get dependable and authentic data.

** First increase in 3 ½ years of mor period under OFA came in early 1944.

**Another OFA increase on an allowed on April 11, 1946. OFA controls were released in December, 1946.

PULP-Continued

could include President Harry S. Truman. And already there was a fluttering of a new fear being expressed which was that the series of tariff cuts might also cut pump imports-but would mean more paper imports.

There were optimists everywhere as the market held; you could find them in the mills and in midtown Manhattan where pulp is bought and sold. You could find now there was the picture of both consumer and producer fearful of the same thing-and for opposite reasons. But even the most pragmatic pulp maker had to admit that his fear was just a tinge of uncertainty beside that of his nonintegrated customer.

The profit margin of the smaller mills (as the non-integrated are colloquially called in the Northeast) was getting small, too, and had dipped, according to APPA reports, from net earnings as percent of sales standpoint, from 5.2 in the first quarter of 1949 to 3.1 in the final quarter. In 1948 they had a tissue-thin margin of 1.7 in the third quarter although they recovered to 4.1%. Compared with the average of the non-integrated mills, which had hovered around 10-plus for two years, the non-integrated consumers were adventurers indeed.

PULP IN THE MIDDLEWEST Two New Sources of Supply **But Cut-Backs Are Likely, Too**

Two new sources of pulp were produced in the Middle West in 1949. The Green Bay (Wis.) Pulp & Paper Co. began turning out semi-chemical pulp at the rate of 50 tons per day. It was market pulp. Most of the semi-chemical production in

SWEDEN'S WOOD PULP EXPORTS TO ALL COUNTRIES

As Compared with Exports to the U. S. (in short tons)

Years-	Binached	Unbleached	Bleached	Unbleached	Ground-
	Sulfite	Sulfite	Sulfate	Sulfate	wood
1938 (To All Countries)	304,078	571,077	92.793	575,508	297,430
	156,340	710,709	13.088	70,889	10,600
1945 (To All Countries)	262 ,1%6	49,787	43 .273	536 . 144	314,654
	56 ,496	283,959	28 .070	274 . 429	27,933
1946 (To All Countries)	397,120	572,831	69,938	899,656	264 .704
	23,315	151,261	32,772	168,704	8 .777
1947 (To All Countries).	445,607	539,569	136,701	462,120	223,837
	40,076	218,918	56,282	201,440	12,532
IDER (To All Countries)	449,994	454,463	160,363	403 , 108	215,432
	37,827	155,086	65,967	114 , 065	2,558
1949 (To All Countries)	578.965	530,448	197,380	496 , 287	284,350
	42,130	129,902	70,013	186 , 160	7,547

1949 Source: Svensk Pappersnametidning.

the Middle West has been made by mills which use their own product.

Consolidated Water Power & Paper Co. Wisconsin Rapids, Wis., announced culmination of its semi-chemical process development and it is now producing pulp -- for its own use.

Paper and pulp men know the advantages and limitations of this short-fibered sulfite pulp suitable for inclusion in many kinds of board and paper.

But one of the features of this semichemical pulp is also a factor that is closely woven into the entire Middle West pulp situation of today. Semi-chemical uses available popple (poplar) and saves on the short-in-supply spruces and prime woods.

Today, Middle West mills are vitally affected by what one pulp executive aptly terms the inexorable "economics of wood supply."

In 1949, the Middle West pulp mills continued to feel the shortage of the Lake States supply, felt the pinch from the diminishing Canadian entry of pulpwood, saw some mills going as far as Montana for pulpwood and thought they saw more than a shadow of the hand on the wall for others when the Port Huron (Mich.) Sulfite & Paper Co. closed late in the

Most were faced with almost immediate huge expenditures in addition to the large sums that have been spent since the war for modernizations.

Many of the mills quickened their activities and interest in tree growing, sustained yields, reforestation. It had gone beyond the "industrial-hobby" classification. Better forestry and sustained yields had become big business in the Lake States

Others, like Rhinelander and Marathon, were spending more across the border into Ontario for increasing their pulp supply. At the close of the year, Rhinelander indicated it had plans for additional production at Fort William Ontario.

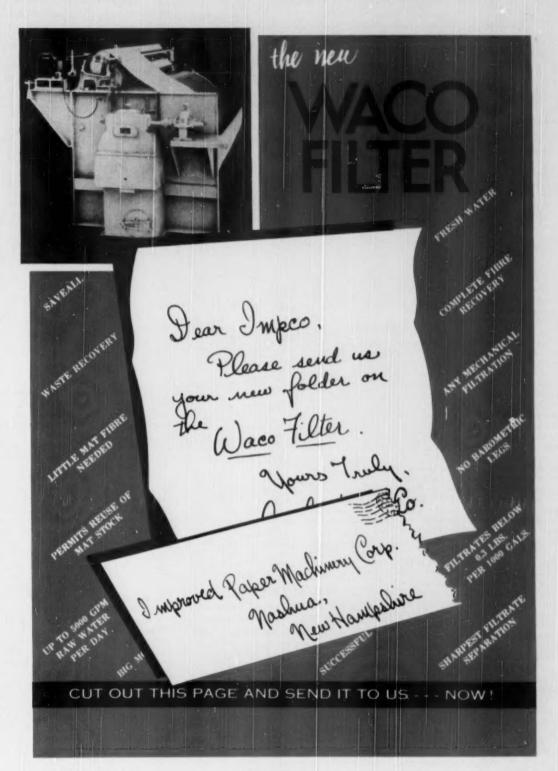
As if these all were not problems enough to the pulp mill executives, the unavailability of Lakes States pulpwood was making other weighty decisions all the tougher.

The sulfite producers in the Lake States were, during 1949, drawn into a race against time to file plans and begin installations of costly equipment to par-

REGIONAL ORIGIN OF SALES OF DOMESTIC MARKET PULP IN U. S. All Grades Except Defibrated—Tons of 2,000 lbs.—Showing imported and domestic supply for consumers

Year	Pacific	South	New England			Total U.S.	Mkt Pulp Imports	Total Supply
1947 (Tone) 1947 (Percentage) 1944 (Tone) 1944 (Percentage) 1949 (Tone)	727 .135 22 .6 % 801 .842 25 .2 % 751 .267	227 .770 7 .0 % 230 .744 7 . 2 %	218,451 6.7% 188,527 5.84% 165,815	96.705 3.0% 95.559 2.96% 59.801	69,732 2.1% 60,920 1.08% 45,526	1.339.793 41.57% 1.377.592 42.28% 1.206.891	1,883,157 58,43% 1,739,120 57,72% 1,304,326	3,222,980 100 3,116,712 100 2,511,217

Source: As reported to U. S. Pulp Producers Assn.



CANADIAN WOODPULP PRODUCTION BY PROVINCES

Quantity in Tone Value in Dollars

Years	Quebec	Ontario	Beitish Columbia	Provinces	TOTAL
1965 Toma	\$114,197,036	1,468,683	\$20, 571	724 385	5,600,841
1965 Value		562,596,266	\$21, 998, 381	833 681 445	\$231,873,12;
1966 Tons		1,834,975	520, 779	795 803	6,612,410
1966 Value		564,649,618	\$24, 216, 820	838 427 478	\$287,628,22;
1967 Yalue		2,100,237	993, 165	808 690	7,233,67;
1967 Value		5122,382,058	\$37, 720, 328	848 945 522	\$403,483,23;
1968 Toma*		2,276,124	688, 209	858 674	7,674,07;
1968 Toma*		5155,670,832	\$49, 220, 655	\$55 449 132	\$485,966,166

distinction on U. S. Production of Pulp by States are not available, according to U. S. Dept. of Commerce.)

PULP-Continued

tially abate stream pollution from spent white sulfite liquor. Variables in existing known disposal systems made the mill answers to the anti-pollution forces the answers to the \$2 million jack-pot question—with a gamble in it.

These sulfite producers contributed to research and pilot plant funds through their Sulfite Research League, composed of 11 companies, operating 14 mills, all in Wisconsin, except one in Michigan—The Detroit Sulfite mill. These league members produce 90% of all Wisconsin sulfite pulp and 33% of Michigan totals.

We mentioned "economics of wood." With, or without, the orders from the State of Wisconsin to the mills saying they must file their stream abatement system plans by the end of 1950; and complete the work by the end of 1951, some of the mills probably figured that the shortage of wood would eventually cause them to reduce production or cease operation anyway.

However, that is a matter of some fact and some conjecture. Time has a way of changing things, and they could conceivably find themselves working on a wood supply many years hence.

But, if forced to spend millions immediately for evaporating, or yeast making, or Mg0, or ammonia systems, it was a load of pulp drawn by a horse of a different color.

Consolidated's plant at Interlake was admitted to be antiquated in a lot of its present equipment. Before it would be wise to spend heavily for sulfite disposal, it would first have to put in a vast modernizing program. It didn't seem sound business, but the State didn't relent. So, by the public record itself, unless there is a change, this sulfite pulp mill will close by the end of 1950.

The combination of other sources of wood and pulp gives highly-integrated Kimberly-Clark sources of pulp supply from outside the Lake States. Why should it, then, spend a lot of money on partially-questionable processes? Kimberly-Clark answered that one for its Kimberly, Wis., mill. If \$2 million would buy a plant that will abate the stream by approximately 50%, it would cut-back its production that much, reduce the sulfite flow to the stream by that figure, and not spend the money.

The State Pollution Committee, apparently not taking into account possible loss of payrolls, ordered K-C to cut-back 40% by July 1, 1950.

CANADA-PULP PRODUCTION

	ons of 2,006	(Iba.)	
Mechanical	Suifite	Alkaline	Total
Tons	Tons	Tone	Tons
1.090.114	654.273	188.487	1,922,774
931,560	476.929		1,539,826
1,241,185	678.876		2.137,925
1,449,106			2,413,586
1,427,782	768,035	218,207	2,414,024
1,621,917	842,785	342,207	2,706,909
1,901,26H	905,203		3,152,545
1,922,124	1,016,060		3,200,696
2,127,699	1,117,227		3,501,895
2,420,774			3,907,110
2.283.130	1.076.804		3,548,187
2.016.480	941,586	145,156	3,103,222
1,696,021	941,579		2,781,967
1,859,049	937,313		2,979,350
2,340,441	1.020.493		3,566,914
	1.035.000		3,689,000
2,910,338	1,168,927	273,494	4,352,759
3,308,517	1,373,232	312,741	4,994,490
2,650,000	925,000		3,833,000
	1.028.820		4,080,459
3,305,484	1,480,545	399,267	5,290,762
3,494,922	1.664.516	426,743	5,720,847
3 , 260 , 01:7	1.753.453	459,254	5,472,804
2,998,913	1.712.571	441.421	5,152,905
3.026.296		467.726	5,153,651
3,341,900	1.639.664	478 740	5,460,344
3.997,846	1.830.017	562.233	6,390,098
4 . 280 . 7:11	2.030.137		7.009.998
4,413,513		815.076	7,366,600
			7.541.000
	Tons 1,090,114 931,589 1,241,185 1,449,100 1,427,782 1,621,917 1,901,288 1,922,124 2,127,699 2,127,699 2,127,699 2,127,699 2,128,130 2,127,699 2,128,130 2,127,699 2,127,699 2,127,699 2,127,699 2,127,699 2,127,699 2,133,308 3,308 5,17 2,650,000 2,910,338 3,308 5,17 2,650,000 2,910,338 3,308 5,17 2,650,000 2,910,338 3,308 5,17 2,650,000 2,910,338 3,303,484 2,209 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,330,484 2,313,313,310 2,313,310 2,313,310 2,313,310 2,313,310 2,313,310 2,313,3	Tone Tone Tone 1,090,114 634,273 931,560,476,929 1,241,185 678,878 1,449,106 1,427,782 748,035 1,421,917 842,783 1,991,258 1,991,268 1,9	Toos Toos Toos Toos Toos Toos Toos Toos

Source: Dominion Bureau of Statistics except for the last year which is estimated by Daily Mill Stock Reporter, and includes Newfoundland.

But for sulfite mills like Hoberg and Northern at Green Bay, their integrated set-ups and their sources of wood supply, made the spending of money for engineering to fact-find a suitable system, worthwhile. Each had until the end of 1950 to file plans with the state. They were in business to stay and were doing everything they could to comply with a stiff order.

The situations of these four mills described in the preceding paragraphs illust ate the extreme tends of the scale in the pollution dilemma. The best guess seems to be that the final sifting will find all the remaining mills falling into one of the categories, or because of specific situations of their own, falling somewhere in the middle. There will be some decisions of magnitude made in 1950 and 1951.

PULP IN EAST CANADA One New Mill in Past Year Curlator Significant Advance

For the Canadian pulp and paper mills 1949 was a year for settling down and consolidation. In the east one new mill—Fraser Companies' kraft operation at Newcastle, N. B.—went into production late in the year, but the boom in new construction, represented by the multi-million-dollar expansion along the northern shore of Lake Superior and the adjacent country, was over.

Now at Bathurst, B. C., another new semi-chemical plant is planned for industrial paper board of 25,000 tons annually, follows a lead by Abitibi at Sturgeon Falls., Ont., in pioneering semichemical pulping.

CANADA'S PULP EXPORTS

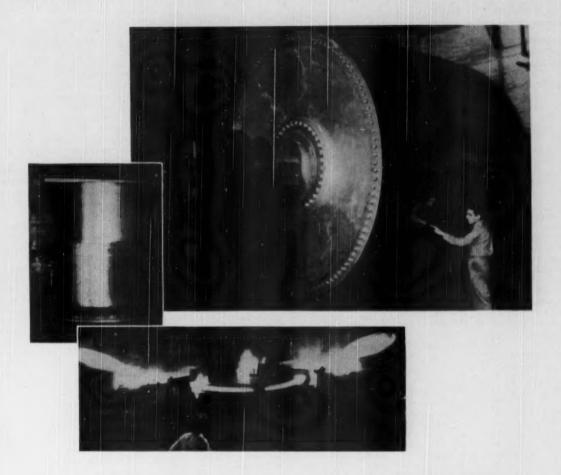
Year	Tons	Value
1949*	1,557,348	\$171,504,163
1948	1,796,998	211,564,384
1947	1,698,712	177,802,612
1946	1,418,558	114,020,659
1945	1,434,523	106,054,917
1944	1,408,075	101,563,024
1943	1,556,727	100,015,094
1942	1,510,727	95,266,873
1941	1,411,720	85,897,736
1940	1,068,490	60,930,149
1939	705,515	31,000,602
1938	554,034	27,730,738
1937	870,711	41,815,731
1936	754,489	31,246,695
1935	662,468	27,625,730
1934	605,635	25,444,844
1933	608,509	23,354,637
1932	452,292	18,930,065
1931	622,531	30,056,643
1930	760,172	39,059,979
1929	835,709	43,577,021
1928	863,806	45,614,323
1927	879,155	46,996,011
1926	1,003,081	52,077,122
1925	959,671	47,931,905
1924	781,978	40,242,972
1923	875,358	37,027,496
1922	818,246	41,037,849
1921	527,222	33,133,675

*Including Newfoundland. Source: Canadian Dominion Bureau of Statistics.

The bright new mills at Marathon, Terrace Bay, Red Rock and Espanola were now a part of the finished picture, fully established and performing well. Kimberly-Clark was proceeding with a \$3,000,000 extension of its crepe wadding plant at Kapuskasing, but for the time being pulp mill construction currently under way in Canada is confined to the West Coast. There was activity in the bleaching field last year, with new bleacheries established by Fraser at Edmunston, N. B.; at Hull for the E. B. Eddy Co., and at LaTuque for Brown Corp., but these, too, were completed jobs.

For the market pulp producers the year was marked by periods of uncertainty, but most of the new Canadian capacity was in mills subsidiary to large U. S. paper companies with their own selling and distribution machinery. Marathon, for instance, produced bleached kraft for Marathon Corp. in Wisconsin; LongLac at Terrace Bay for Kimberly-Clark Corp. in Wisconsin and elsewhere, and Espanola's KVP Co. for Kalamazoo Vegetable Parchment Co. in Michigan.

Chemical pulp shipments from Canada actually declined by about 12% during the year, but the groundwood pulp producers felt the loss most keenly for their shipments were down 30%. But in the overall picture the groundwood factor is relatively negligible because mills producing that grade represent only 5% of the total pulp production and their shipments only one-eighth of Canadian pulp shipments. As with newsprint, more than



A REFLECTION OF QUALITY

The mirror like finish on this 12-foot Yankee dryer reflects the same quality built into more than 425 rolls at Newport News since the war's end. Twenty-six dryer rolls of the size shown have been cast and machined with a finish to meet the users' requirements.

The rugged performance record of the Newport News all welded log barker has proven the soundness of its sturdy one piece construction. Other Newport News papermaking equipment in use in leading mills includes head boxes, digesters and tanks. INQUIRIES ARE INVITED.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

PULP-Continued

90% of the pulp made for sale in Canada is exported.

Pulp buyers, particularly in the U. S., acquired large inventories of pulp during the early postwar years and these proved out of proportion to the current demand at the outset of 1949. They were a cloud over the market, but it was dispersed more quickly than had been anticipated. Instead of lingering in the sky until the final quarter, inventories in the hands of pulp consumers had decreased substantially by midsummer and demand forthwith climbed.

As an illustration, in May chemical pulp shipments were off almost 20% from the preceding year, but by October the gap had been closed to 4%. In May groundwood pulp shipments had dropped by 30%, but October shipments were only 80% below 1948. The United States, as usual, took the bulk of the exports. Total exports for the past year were 1,400,000 tons, with exports overseas 235,000 tons, an increase over 1948. Maintenance of the tonnage shipped to non-dollar countries was largely due to purchases under ECA. Britain, for instance, while staying out of the newsprint picture, is continuing to buy Canadian pulp.

"Dollar difficulties will, of course, tend to make the non-dollar countries look to Scandinavia for their pulp imports," points out R. M. Fowler, president of the Canadian Pulp and Paper Association. "But Scandinavia cannot apparently support the demand of the entire non-dollar world for chemical pulp, for newsprint and the groundwood pulp required to manufacture newsprint. Thus it is expected that Canada will continue to export pulp in 1950 to countries in the sterling area, though there may be some reduction in tonnage. Improvement in the world pulp trade, like all other international trade, seems to depend on the ability of the nations to turn the key in the currency padlock that now restrains the freer flow of goods between peoples. Meanwhile, the scientist and technician have steadily been developing exciting applications and new usages for chemical pulp which may create a demand for it surpassing that of all the world's paper mills.

The one completely new pulp mill that went into production last year—Fraser's—is located on the site of the old Millerton kraft plant in New Brunswick that was destroyed 20 years ago. Its output of 120 tons daily is being shipped by rail 250 miles to the company's main mill at Edmunston, N. B., where a six-stage continuous bleach system was recently installed. (The Newcastle mill was described in the April issue of PULF & PAPER.)

E. B. Eddy Co.'s new bleach plants, designed by Skadler, Hurter & Co., was one of the interesting developments of the year. It has a rated capacity of about 150 tons of bleached sulfite daily. Housed in a new five-floor building, the plant is completely modern, one of the features being provision for remote control of practically every operation and the wide range of instrumentation. The plant is also unusual in that the production of bleached sulfite pulp is an integrated part of the whole mill, the Eddy Co. controlling every stage of the production process from pulpwood to the finished bleach product, which finds a variety of end uses in fine papers, letter stock, tissues, etc.

Machinery and equipment include Sherbrooke Machineries (Improved Paper Machinery Corp.) two-stage acid washers, four lines of Smythe screens, Lithcoted piping, Stebbins tiling, a Kamyr machine supplied by Paper Machinery, Ltd., designed for 80 tons, 80 inches to the sheet. The sheets are dried to 52 to 54%, this being sufficient inasmuch as they are used in other parts of the mill for further processing and distant transportation is not involved. Variable speed controls in package units were supplied by Reliance Electric & Engineering Co., Cleveland.

Somewhat bigger is Brown Corp.'s new bleach plant at LaTuque, Que., with a capacity of 300 tons per day of fully bleached kraft pulp. The bleaching is carried out in six stages, each step being fully instrumented. The building was designed by E. & B. Cowan of Montreal, with O. C. Schoenwerk of Chicago consulting engineer in design and construction. Sherbrooke Machineries supplied the six washers; Bristol Co. supplied instruments.

Incidentally, Brown Corp. now operates at LaTuque the largest sulfate mill in Canada, with a production of 450 to 500 tons daily and it is now producing more bleached sulfate than any other mill in the world.

Among the most significant technical development in the Canadian pulp industry was the successful operation of the Curlator in its application to high yield newsprint sulfite at the Riverbend, Que., mill of Price Brothers & Co. The Curlator, which has now found ready commercial acceptance, makes permanent changes in the shape of pulp fibres by causing nodules of high consistency pulp to roll in changing directions between two surfaces which compress the nodules. The Curlator is now being manufactured by Curlator Corp., 565 Blossom Road, Rochester, N. Y.

Almost every large Canadian company improved its pulp manufacturing facilities during the year. Abitibi Power & Paper Co., for instance, installed extensive new grinding plant at Port Arthur, Ont., and Iroquois Falls. Ont., and a new caustic extraction stage was added to its Smooth Rock Falls (Ont.), mill. Port Arthur has five lines of Waterous magazine grinders and two new barkers. The Iroquois Falls mill (described in January issue of PULP & PAPER) has 20 continuous superhydraulic magazine Waterous grinders, seven Horton barking drums, three Bauer refiners in the screen room and two in the board mill, and four Sherbrooke filters. Ventilation was provided at both these mills by Ross Engineering Co.

Gulf Pulp & Paper Co. at Clarke City, Que., installed four Wood Pulp Machinery ring grinders to replace 24 pocket grinders; Great Lakes Paper Co. installed a digester to add 50 tons to capacity for Rhinelander Paper Co. in Wisconsin.

Marathon Paper Mills of Canada put in four chip screens among other innovations, and Canadian International Paper Co.'s bleached sulfite mill at Hawkesbury was given a new filtering building and sedimentation basins.

It was a busy year for Anglo-Newfoundland Development Co. at Grand Falls, Newfoundland, where finishing touches were put on an extensive modernization program. Four Lukenweld steel dryers were installed to bring ca-



GENERAL VIEW of Crossott Paper Mills, at Crossett, Ark., showing from left to right: The Research Building; the big machine room with office in fareground, and the pulp mill, with service building in fareground.

AT LEFT, THE PULP MILL; and at right, new building to hause Combustion Engineering recovery boiler, Belait Machine, Ross Engineering hood, General Electric drive. A Combustion Engineering boiler, Western Precipitation Cottrell precipitator and Goslin-Birminghom evaporators are new equipment completed in 1950.



MARATHON

High Quality Bleached

SULPHATE PULP



Manufactured by

MARATHON PAPER MILLS of CANADA, LTD.
MARATHON, ONTARIO



Sales Agent

MARATHON CORPORATION

Rothschild, Wisconsin

PULP-Continued

pacity for export sulfite pulp to 80 tons. A new stock preparing system was also established, with flyorapulper and Hydrahner. Three machines were rebuilt with new equipment from Bagley & Sewell and Dominion Engineering Co.,

During 1949, pulp producers in Canada carried out many projects for improvement of quality that had been postponed during recent years of unusually active demand. The industry was therefore in a stronger competitive position and entered 1950 with somewhat less than normal inventories on hand by both producers and consumers.

The Pulp and Paper Research Institute of Canada has continued to play an important part in exploring new trends and processes in pulp manufacture and in developing new technique. Some of the projects recently undertaken were related to an investigation of the permeability of cellulose to the vapor of water and other liquids, a study of the basic process by which a pulpstone operates to break down a log to usable pulp, chemical reactivity of cellulose, wood lignins, the chemical constituents of spruce bark.

Use of bleached groundwood pulp is expected to increase in the future, particularly for making better grade paper, duplicator paper and paper to be used for conversion processes. Not until recently has groundwood pulp been used extensively for the manufacture of medium grade papers because, despite its low cost, it has few other characteristics to offset its limited aging properties. But a high yield of pulp is obtained in the groundwood process now and the industry is seeking to expand its uses by bleaching it. The bleaching enhances the printing characteristics of the pulp. Bleached groundwood pulp can be used for producing papers in which brightness, bulk. opacity, absorbency and printability are important, but in which strength and long life are of secondary importance .

U. S. PACIFIC COAST

Tone of 2,000 lbs. (except defibrated pulp)

1923	. 299,596	1932	607.662	1941	1,994,150
1924	309.433	1933	773 102	1942	.1.968.658
1925	322.594	1934		1943	1.521.531
1926	378,005	1935		1944	1.644.531
1927	449.218	1936	1.198.431	1945	1.591.789
1928	562.514	1937	1.523.192	1946	1.694.959
1929	780 494		1.087.747	1947	2.005.089
1930	.815.089		1.384.147	1948	2,116,238
1931	817 548	1940		1949	2.078.526

Source: U. S. Pulp Producers Assn.

Australia May Make Canna Lily Pulp

Australia has a new fiber from which it is hoped that chemical pulp, as well as twine, wool packs and sacks, can be produced.

The fiber is obtained from the canna indica, canna lily, which grows prolifically in the commonwealth.

The fact that the fiber is capable of being spun had never been investigated because of its high water content. It produces a similar percentage of fiber to sisal and other fiber-bearing plants, and it matures in 12 weeks against years for other fibers.

Eric Bedford, who has been carrying on the experiments, has invented "harvester-crusher" machine for doing the job which he has patented as "an improved method and means for obtaining cellulose."

The crusher has the orthodox type of cutting knives, a conveyor which runs the material through a series of rollers, and a series of beaters which make the material into a mat which is wound on a drum at the rear of the machine. As each drum is filled it is let down to the field, and an empty drum is placed in position to take a further cutting of the matted fiber. The drums are then loaded on trucks and hauled to the treatment plant, where they are arranged on holders above a traveling conveyer belt.

The fibrous material is then fed to the conveyer, and a further treatment of beating and washing is carried out until the material is free of the non-fibrous matter. Should a pure cellulose be required for the purpose of manufacturing viscose for rayon or a chemical pulp for paper manufacture, the material is not dried but is conveyed through a vat containing an acid or an alkali, either with or without pressure and, after cooking, is washed and bleached. By this method the batch system of pressure digestion is eliminated, and a great saving in time and chemicals is effected.

The canna is the only material known which can be treated so simply and purely mechanically to a stage where the fiber is isolated. All other materials require either hand harvesting, decorticating or retting, and sometimes the whole three of these slow and costly processes are necessary.

Site of the experimental nursery is at

Penrith, New South Wales, about 20 miles west of Sydney. New Process Fiber Pty. Ltd. plans to plant large areas and 1000 acres will be under cultivation by next spring. Three crops a year are regarded as possible and since the canna is a perennial only one planting is necessary.

St. Lawrence Installs First Pump of Its Type



Installation of a new type of vacuum pump on No. 3 machine of the St. Lawrence Paper Mills in Three Rivers, Que., is expected to result in substantially increased production.

The pump, installed by Canadian Ingersoll-Rand, is a

two-cylinder reciprocating vacuum unit of which one cylinder is vertical and the other horizontal, both pistons being driven from the same crankshaft.

The vertical cylinder takes care of the couch vacuum and the horizontal cylinder functions for the two press rolls. The flat boxes are connected to a small rotary pump entirely separate from the main installation.

General Manager A. George Jacques of St. Lawrence tells Pulp & Paper that this is probably the first reciprocating vacuum pump installed in the newsprint industry in which the two cylinders are not of the same size.

The Three Rivers mill at St. Lawrence is one of the larger newsprint producers in Eastern Canada with a daily output of more than 600 tons from its six machines. C. Jentz is general superintendent.

U. S. PULP STATISTICS PREPARED BY U. S. PULP PRODUCERS ASSOCIATION

All data are in tons of 2000 pounds, air dry weight. All 1947 Census data are based on 1947 Census Manufacturers. All 1948 Census data are preliminary and based on monthly reports to U. S. Bureau of Census. It is believed that some pulp produced and sold as unbleached pulp is later bleached at the paper mills and reported as consumption of bleached pulp. This accounts for some seeming discrepancies between new supply, consumption and change in stocks.

Capacity—Based on reports to the U. S. Pulp Producers Association. Bleached capacity is maximum bleaching capacity of mills' bleaching facilities.

Production—Total: U. S. Bureau of Census for all major grades. Other grades estimated from Census Bureau combined data. Mayor: As reported to U.S.P.P.A. for all grades except defibrated. Defibrated data estimated from Census data.

Imports—Total: U. S. Bureau of Census except bleached, semi-bleached and unbleached sulfate, which have been estimated from Census Bureau's total sulfate imports. Marker: Estimates by U.S.P.P.A., based on total imports minum receipts of "own pulp" from Canada as reported by Bureau of Census.

reported by Bureau of Census.

Exports—U. S. Bureau of Census. Includes domestic and foreign pulp exported.

New Supply—Production plus Imports minus Exports.

Consumption in Non-Paper—Estimates by U.S. P.P.A. for pulp consumed by producers of rayon, cellophane, etc. Consumption in Paper & Board Mills and In-

Consumption in Paper & Board Mills and Inventories at Pulp, Paper & Board Mills—Total. & Marker: Bureau of the Census for all major grades. Other grades estimated from Census Bureau's combined totals.

TOTAL WOOD PULP, ALL GRADES

	1948	1949 %	Change '48-'49
Capacity	14.159.046	15.210.261	+ 7
Production	12,872,292	12,153,345	- 6
Imports	3,176,111	1.762.945	- 19
Exports	93,727	124,217	+ 33
New Supply	14,954,676	13.792,073	- 8
Consumption	15,006,847	14,183,073	- 5
In Paper & Board	14.346.847	13,608,073	- 5
In Non-Paper Inventory 12/31 at pulp, paper and	660,000	575,000	- 13
board mills	710,382	516,451	- 27

MARKET WOOD PULP, ALL GRADES

	1948	1040 %	Change
Production	1,502,323	1,319,902	- 12
Imports	1,738,059	1,298,650	- 25
Exports	93,727	124,217	+ 33
New Supply	3,146,655	2.494.335	- 21
Consumption	3,219,386	2,887,625	- 10
In Paper & Board	2.586.386	2.337.625	- 10
In Non-Paper	633.000	550.000	- 13
Inventory 12/31	544,796	376,007	- 31
At Pulp Mills	26,251	32,801	+ 25
At Pa. & Bd. mills	518,545	343,206	- 34

High Grade

BLEACHED SULPHITE PULP

SOUNDVIEW PULP COMPANY EVERETT WASHINGTON

1950 Review Number

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	TOTAL SULFIT
(Cartinual)	

	1948	1949	Change
Capacity	2.978.356	1,988,596	0
Production Imports	1,231,018	878,203	- IO - 29
New Supply	3.959,334	3,339,090	- 16
Consumption	3,962,121	3,550,547	- 10
In Paper & Hoard. In Hon-Paper Inventory Dec. 31st	3,334,121 628,000	3,009,547 530,000	- 10 - 12
at all Mills	370.076	566 016	- 22

MARKET SULFITE

	1948	1949	Change 48-49
Production	1,089,047	968,103	- 11
Exports	84,900	\$40,346 85,202	- 30
Maw Bupply	7,059,243	1,623,247	- 21
Consumption	2,077,925	1,856,975	- 11
In Paper & Board.	1,454,925	1,811,975	- 10
In Non-Paper	623,000	545,000	
Inventory 12/31	314,220	217,297	- 31
At Pulp Mills	16,818	23,799	+ 42
At Pa. & Bd. Mills	297 402	193 498	- 35

TOTAL BLEACHED SULFITE

Capacity Production Imports Exports New Supply Concomption	7948 2,970,633 1,909,492 558,211 31,210 2,436,503 2,484,531	2,160,263 1,830,434 486,236 3,271,583 3,400,276	- 13 + 45 - 7
In Paper & Board	1,856,321	1,850,276	0
In Non-Paper	628,000	550,000	
Inv. 13/31 all mills	156,764	130,868	

MARKET BLEACHED SULFITE

	1948	1949 70	'48-'89
Production	854,263	815,732	5
Imports	469,310	417,264	- 11
Raports New Supply	1,292,363	1,187,760	
Consumption	1,334,000	1,309,335	- 2
In Paper & Board In Non-Paper	711,000 623,000	764 .335 545 .000	
Inventory 13/31	139,969	119,600	- 15
At Pulp mills	12.617	20,132	+ 60

PAPER GRADES OF BLEACHED SULFITE

Production Imports Exports New Supply Consumption	1948 1,487,478 322,830 13,228 1,797,080 1,819,321		48-	29
In Paper & Board. In Non-Paper Inv. 12/31 all mills* * Inc. any dissolving	1,801,321 18,000 151,410 pulp at paper	1,800,276 15,000 115,071 and board mil		17

MARKET PAPER GRADES BL. SULFITE

	1948	1949	Change
Production	438,196	449,384	+ 3
Imports	233,829	262,916	+ 12
Exports	13,228	19.743	+ 49
New Bupply	658,797	692,557	+ 5
Consumption	674,000	729,335	+ 8
In Paper & Board.	661,000	719.335	+ 0
In Noz-Paper	13.000	10,000	
Inventory 13/31	134,918	104,516	
At pulp mills	7.566	5.040	- 33
At Pa. & Bd. mills.	127.352*	99,476	

DISSOLVING-SPECIAL CHEM. GRADES

Production Imports Exports New Supply Consumption	1948 421,924 235,481 17,982 639,423 665,000	7949 371,422 154,348 25,493 500,277 585,000	Change '48-'49 - 12 - 34 + 42 - 22 - 12
In Paper & Board	55,000	\$0,000	- 9
In Non-Paper	610,000	\$35,000	- 12
Inv. 12/31 pulp mile	5,554	15,797	+ 184

MARKET DISSOLVING & SPECIAL CHEM.

	1948	7949	48-'49
Production	416.067	366.348	- 12
Imports	235.481	154,348	- 34
Exports	17,982	25,493	+ 42
New Supply	633.566	495,203	- 22
Consumption	660,000	\$80,000	- 12
In Paper & Board	50.000	45.000	- 10
In Non-Paper	610.000	535,000	- 12
Name 2 2 /2 2 modes models	6 055	15 000	1.000

TOTAL UNBLEACHED SULFITE

	1948	1949	'48-'49
Production	901.814	706,655	- 22
Imports	674 . 707	391,816	- 42
Exports	53,690	39,966	- 26
New Supply	1,522,831	1,058,505	- 30
Cons. Paper & Bd	1,477,800	1,159,271	- 22
Inv. 12/31 all mills.	313,113	138,150	- 35

MARKET UNBLEACHED SULFITE

	1948	1949 %	'48-'49
Production	234,784	152.371	- 35
Imports	585.786	323,082	- 43
Esperts	53,490	39,966	- 26
New Supply	766.880	435,487	- 43
Cons. Paper & Bd.	743 .925	\$47,640	- 26
Inv. 12/31	174,251	97,689	- 44
At pulp mills	4,201	3,667	~ 13
At Pa & Bd mills	170 050	94 522	- 45

TOTAL SULFATE

		70	L.hange
	1948	1949	48-49
Capacity	6,289,537	6,953,560	+ 11
Production	6,013,696	5,982,091	- 1
Imports	614,438	640,195	+ 4
Exports	6.831	36 776	4438
New Supply	6,621,303	6,585,510	- 1
Consumption	6,667,514	6,695,245	0
In Paper & Board.	6.663.514	6 .693 ,245	0
In Non-Paper	4.010	2.000	- 50
Inv. 12/31 all mills.	325,754	149,257	- 34

MARKET SULFATE

	7040	%	Change
Production	216,392	203,361	- 6
Imports	465,255	399,784	- 14
Exports	6,831	36,776	+438
New Supply Consumption	674,816 734,379	566,369 675,371	- 16
In Paper & Board . In Non-Paper	720,379	673,371	- 7 - 50
Inventory 12/31	162,299	105,921	- 35
At pulp mills	4,739	2,505	- 47

TOTAL FULLY BLEACHED SULFATE

	1948	1949 %	Change
Capacity	1.547.567	1.748.766	+ 13
Production	1.040.055	1.128.531	- 9
Imports	251.099	379.102	+ 51
Exports	716	9.468	
New Supply	1,290,438	1.498.165	+ 16
Cons. Paper & Bd.	1.305.373	1.503.175	15
Inv. 12/31 all mills	67.140	69.820	4

MARKET FULLY BLEACHED SULFATE

	7948	1949 %	Change
Production	66.586	130.771	+ 81
Imports	160.034	169,996	+ 6
Exports	716	9,468	
New Supply	225.904	281,299	+ 25
Cons. Paper & Bd.	246,663	299,557	+ 21
Inventory 12/31	39,083	37,440	- 4
At Pulp Mills	400	155	- 61
At Pa. & Bc. milla	38.682	37.285	- 4

TOTAL SEMIBLEACHED SULFATE

	1044	7040 %	Change
Production	324.751	263.226	+ 17
Emports	26.890	12.822	- 53
Exports	0	74	
New Supply	251,641	275,974	+ 10
Cons. Paper & Ed.	251,465	276,380	+ 10

MARKET SEMIBLEACHED SULFATE

	1948	1949	Change '48-'49
Production	3,933	9.334	+137
Exports	13,792	7,220	- 43
New Supply	17,725	16,480	- 7
Cons. Paper & Bd	17,556	14,978	- 15
Inventory 12/31	4,239	3,558	- 16
At pulp mills	56	50	- 11
At Pa. & Bd. mills	4,183	3,508	- 16

TOTAL UNBLEACHED SULFATE

	1948	1949	'48-'49
Production	4,748,890	4,590,334	- 3
Imports	336,449	248,271	- 26
Exports	6.115	27.234	+345
New Supply	5.079.224	4,811,371	- 8
Consumption	5,110,676	4,915,690	- 4
In Paper & Board.	5,106,676	4,913,690	- 4
In Non-Paper	4,000	2,000	- 50
Tour 19/91 all mills	255 199	74 073	5.1

MARKET UNBLEACHED SULFATE

		700	Change
	1948	1949	48-49
Production	145.873	73 .254	- 50
Imports	291,429	222,568	- 24
Exports	6,115	27.234	+345
New Supply	431,187	258,590	- 38
Consumption	460,160	360,636	- 11
In Paper & Board	456 .160	358.836	- 11
In Non-Paper	4,000	3.000	- 50
Inventory 17/31	118.978	64,923	- 45
At pulp mills	4.383	2,300	- 46
At Pa. & Bd. mills	114.695	62.623	- 45

TOTAL SODA

	1948	1949 %	Change '48-'49
Capacity	541.253	549,120	+ 1
Production	509.864	481,077	- 6
Imports	24 .843	27,315	+ 10
Exports	595	75	- 87
New Supply	534,112	164,317	- 5
Come, paper & bd.	321,370	514,217	- 1

MARKET SODA

	1948	1949 %	'48-'49
Production	69.827	67.063	- 4
Imports	24,843	27.315	+ 10
Exports	595	75	- 87
New Supply	94.075	94,303	0
Cons. paper & bd	81,301	95,937	+ 18
Inventory 12/31	17,574	8,790	50
At pulp milla	204	284	+ 39
At Pu. & Bd. Mills	17,370	8.506	- 51

TOTAL GROUNDWOOD

	1948	1949 %	Change '48-'49
Capacity	2.711,876	2,806,188	+ 3
Production	2,175,107	1,958,535	- 10
Imports	290,984	208.217	- 28
Exports		1,602	
New Supply	2,466,091	2,165,150	- 12
Consumption	2,469,930	2,215,360	- 10
In Paper & Board	2.447.930	2,195,360	- 10
In Non-Paper	22,000	20,000	- 9

MARKET GROUNDWOOD

	1948	1949 %	Change '48-'49
Preduction	67,554	39,611	- 41
Insports	188,583	129,856	- 31
Exports	0	1.602	
New Supply	256.137	167.875	- 34
Cons. Paper & Bd	265.774	215,927	- 19
Inventory 12/31	41,577	33,410	- 30
At pulp mills	125	375	+200

TOTAL SCREENINGS, OFF-QUALITY

I WINE GONES			
	1948	1949 %	Change '48-'49
Production	139.877	130.968	- 6
Imports	12,828	9.015	- 30
Exports	1,401	562	- 60
New Supply	151.304	139.421	- 8
Consumption	154,541	132,471	- 14
In Paper & Board	148,541	129,471	- 13
In Non-Paper	6,000	3,000	- 50
Inv. 12/31 all milla.	13,543	14,519	+ 7

TOTAL DEFIBRATED & EXPLODED

Capacity Production	1948 1,040,801 744,671	1949 1,200,000 650,460	Change '48-'49 + 15 - 13
Imports		0	0
Exports		0	0
New Supply	744 671	650,460	- 13
Cons. Paper & Bd.	746 . 271	651,278	- 13
Inv. 12/31 all mills.	1,601	1,737	- 4

TOTAL SEMICHEMICAL & CHEMFIBRE

Canacitu	1948 547, 773	1949 630,041	Change '48-'49
Capacity			+ 15
Production	477,861	413,125	- 14
Imports	0	0	0
Exports	0	0	0
New Supply	477.861	413,125	- 14
Cons. Paper & Bd.	485 .100	414.955	- 14
Inv. 12/31 all mills.	638	374	- 41

MARKET-ALL OTHER GRADES*

		- 5	Change
	1948	1949	'48-'49
Production	59,503	41.764	- 30
Imports	4,282	1.339	- 61
Exports	1,401	562	60
New Supply	62.384	42.541	- 32
Consumption	70,007	43,415	- 38
In Paper & Board	64.007	40,415	- 37
In Non-Paper	6,000	3.000	56
Inventory 12/31 .	9,126	10,589	+ 16
At pulp mills	4,365	5.838	+ 34
At Pu. & Bd. mills	4.761	4.751	
 8creenings/Off-Qualichemical/Chemfit 		d/Exploded,	& Semi-

of Proven Merit and Established Value

SUPERCALENDERS AND ROLLS TOXICANTS FOR SLIME CONTROL

Appleton Machine Company

Buckman Laboratories

SPLICING TISSUE

Bemis Associates

DRYER CANVAS

DYESTUFFS AND PIGMENTS

Calco Chemical Division
American Cyanamid Company

SLITTERS AND REWINDERS
Cameron Machine Company

FOURDRINIER WIRES
Eastwood-Nealley Corporation

CONSISTENCY CONTROLLERS
Control Equipment Corporation

CALENDER ROLLS AND GRINDERS

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STAINLESS AND MONEL CLOTH
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Charles Mundt & Sons

PULPSTONES

DANDY ROLLS
J. J. Plank Company

SULPHUR Texas Gulf Sulphur Company

F. W. Roberts Mfg. Company

SCREEN PLATES
Union Screen Plate Company

PACIFIC COAST REPRESENTATIVES

Pacific Coast Supply Company

PULPWOOD SECTION

NEW EQUIPMENT DEVELOPED

As the North American industry approached mid-1950, the pulpwood inventories and situations in all regions were described as ranging from "satisfactory" or "excellent," even after severe cold weather and heavy snows slowed up cutting in the Lake States, for example, and had virtually brought logging to a standstill on the Pacific Coast in January, 1950. But as the year progressed the situation improved, and needs of the mills were generally being taken care of.

U. S. mills consumed 19,916,000 cords in 1949, more than 10% below 1948, but this was the second highest total in history, 200,000 cords over 1947. It was a figure which only a few years ago would have been considered very hard to attain, but the far-sighted wood production and conservation methods have changed that picture.

U. S. pulpwood receipts were third highest for any recorded year. Imports from Canada, though maintaining their traditional approximate 10% of the total, were the lowest since 1944. In fact, Canadian imports were 20% less than the Canadian official allocation. Freight rates were reported becoming a serious obstacle to Canadian exports. Mill inventories were at an over-abundant level at the start of 1949—over 5½ million cords; dropped to 4.9 million by June and finished the year still at about that level. Woods labor was ample and wood prices were considered more stable.

Although much work has been done to increase use of hardwoods, their consumption was only about 13%, about the same as in two previous years. But new Southern mills are coming into production to use hardwoods. More will surely be used in the Northeast states where stands far exceed those of conifers and growth over drain is vastly greater.

The U. S. Pulp industry has acquired 20 millions of acres of timber land being placed under sustained yield and from time to time more former lumber company timberlands are reported sold to pulp interests.

The latest pulpwood figures for Canada—12,498,000 cords in 1948, compared to 11,-484,000 in 1947—both well over twice the average year production in the 1930's. The average for just the ten years before 1947 was 8,600,000 cords. In latest years, Quebec produced about 50%; Ontario about 25%.

"Brinck" Heads Wood Battle



H.E.BRINCKERHOFF
(left), secretary-treasurer of the American
Pulpwood Association, keeps "up on the
news" in his office in
Manhattan's Daily
News Building, and
that weather eye is on
levelopments involving a battle for more
and more pulpwood.
APA is a war-born

baby which has grown to additional responsibility, because pulp definand was staying up in the postwar era. APA launched a series of meetings at important woodlands operations around the country, where regional problems were considered. At Paper Week, APA gave a comprehensive and informative program, fitting hand-in-glove with—but not part of—the Forestry Information Committee program of APA. The latter are out to educate the public to the need of better use of the forests by modern methods, reforestation and reasonable taxes. "Brinck's men"—his field staff and foresters and participating members—are out to show how it can be done. There is always need for low cost wood—the need may become more or less urgent any time—and this is the goal of APA.

PULPWOOD IN MIDWEST Stabilized for 1950-1951 Company Forests Are Increasing

Of the nation's total consumption of pulpwood output, the Lake States region, the most concentrated in the Middle West, used 12%.

Lake States' mills used extensively from their own supply in Minnesota, Wisconsin and Michigan; from other states, including far-off Montana; and were still getting pulp logs from Canada, but in diminishing supply because of Canadian restrictions. Still, about 25% of its supply came in from Canada.

Statisticians say that since 1927, a total of 22 years, the consumption of pulp logs in Lake States' mills has increased 30%. During that same period we know that the national consumption of paper products increased over 100%. The Middle West mills accounted heavily for a share of that paper increase. Their purchases of market pulp, and imports from their own Canadian digesters, explain the difference.

Most of the Lake States' contracts with loggers, and activities on mill-owned lands, are based on a year from May I through the following April. Pulpwood logging and selling was on the dim side during early 1949. Yard-piled inventories were high.

However, by December the loggers and the woodlands divisions of the companies, saw an upturn, which continued into 1950 and they took a cautiously optimistic view of the months to come.

Most woodlands men in the Middle West thought pulpwood inventories were at normal when March, 1950, had rolled around.

As the head of one of the biggest and most diversified company operations put it: "If we aren't back to normal, it at least looks like the pulpwood industry will be stabilized for 1950-51, and that's good news."

What is the trend toward mechanization in the Middle West? Big companies for 1949 seemed to have maintained programs already begun. This meant purchases for replacements, for allied equipment in conjunction with that already in use, and for maintaining continuity of mechanized operations. In dollars, the purchases ran up.

The little fellow, who runs small logging operations, was strongly affected by poorer market conditions in early 1949. He still shied from mechanization to a great degree, often because of lack of investment dollars and lack of wood-market security. Often, the jump from horse-to tractor-logging was too big a breach to inspire decisions. Yet, one of the independent loggers selling mostly pulpwood from the Michigan peninsula, re-

peatedly stated that he not only had made money in recent years with his mechanized operation, but he was one of the few who made money in the soft markets of 1949.

In part, it was a case of proving, or disproving, logging practice theories under actual conditions of terrain and timber stands. One large company started with tractor and arch logging of tree lengths a few years ago, decreased this activity because it was thought it was damaging the residual stand, and then picked up in 1949 where it had left off because it was found tree-length logging was actually better for the remaining stand.

Lake States loggers look at tree-length cutting and skidding as relatively very new. The forest engineer for one of the biggest companies in Minnesota says that tree-length logging has become quite popular in Minnesota; that it is on the increase. A trend among Lake States' mills is toward more company-owned forests. It is worth noting. Investments, tree planting, silviculture and realistic planning reached new and gratifying heights in 1949. There was a vigorous forestry outlook on every front.

At a high management and forestry meeting held in Upper Wisconsin last fall, C. J. McLaren, vice president of National Container Corp. of Wisconsin,

A MOST UNUSUAL WOODS MEETING M APA was held in the Tamahawk, Wis., v late September 1949—unusual because it b veral president and top drawer executiviscensin pulp and paper industry—show portent wood praduction is to them. importent wood production is to them. The tures show some of the things they sew. D. J. Murray (Wauseu, Wis.) 10-haife blows chipper—first woodlands chipper in Wisconsin-reduces 20 cards to chips in an hour. Right Chips pour out of arched feeder into Bau Mfg. Co. (Jerseyville, III.), Hi-Speed outfund semi-trailist truck. Below: Tithing-bad tracts of many trees demonstrated. mony types demonstrated

WOOD-Continued

Tomahawk, Wis., and an able forestry

"In the three Lakes States we have a potential forest acreage of 50,345,000 acres, which is about equally divided. But there is a catch-70% of the available jack pine, for instance, is in Minnesota, which uses only 29% of the jack pine consumed.

"The public controls 42% of this acreage. Of the private 58%, one-half is owned by farmers. Then 29% of the balance, or one-half the private ownership, is held in industrial or small, scattered ownerships. This represents 14,600,000 acres and the pulp industry owns a little over 2,000,000 or 13% of private land, or 3.74% of the total forest land in the Lake States.

Mr. McLaren stated that National Container feels that there is a great untapped source in the vast amounts of hardwoods.

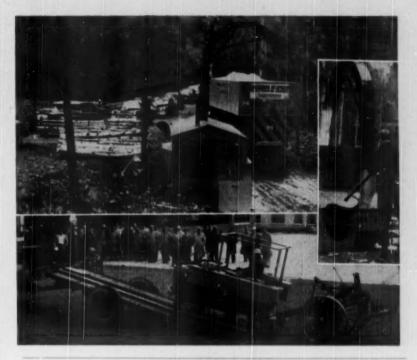
Norman Stone, vice president, Mosinee Paper Co., where its forest holdings of 68,000 acres lie 160-odd miles from the mill, says that 68% of this area is now producing jack pine.

From 1950 to 1956 Mosinee will cut 2600 cords per year. The next 20 years will then allow 8,000 cords cut per year. From 1975 to 1990 the Mosinee plan calls for cutting 18,000 cords per year through this 15-year cycle. By 1991 this acreage should reach the perpetual yield stage-20,000 cords logged each year. By 1949 standards, this pulpwood will cost the firm an average of about \$2.65 a cord from planting period to bringing it out to the edge of the forest.

Nekoosa-Edwards Paper Co.'s distribution of seedling trees to small private forest land owners is notable, in that it provides supervision and equipment for planting.

Trees for Tomorrow, a paper and pulpmill sponsored project with headquarters at Merrill, Wis., was doing an increasingly good job. Another mill recently became a member-Flambeau Paper Co., Park Falls, Wis.

In the spring of 1949 it is estimated 15 million trees were rooted into Wisconsin soil. Another 40,000,000 seeds started in nurseries. In late April, Trees for Tomorrow stood ready to distribute 500,000 free trees to 427 private owners. Guidance was included. This was 150,000 short of requests submitted. Wisconsin forests were on the way back.



U. S. PULPWOOD STATISTICS Receipts, Imports, Consumption and Inventories

(In Thousands of Cords)									
	1949	1949	1947	1946	1945	1944	1943	1942	1941
RECEIPTS								3100	
United States Domestic Imported Northeast	19,252 17,547 1,706	22,333 20,026 2,307 4,039	20,613 18,529 7,084	18.978 16.980 1.997	16,983 15,254 1,729	16,998 15,349 1,650 3,039	15,293 13,581 1,712	17,140 14,908 2,232	16,458 14,177 2,281
Domestic Imported	3,325 2,321 1,004	2,666	2,979	2,508 1,142	2,311	1,976	1,906	2,238	2,252 1,235
Appalachian Donnestic Imported	1,548	1,763 1,739 24	1,633	1,716 1,684 32	1,365	1.472	1,303	1,448	1,376
Bouth Domestic Imported	9.057	9,997	8,227	7,900	7,153	7,090	8,505 8,505	6,622	6,400
Lakes States Domestic Imported	2,160 1,609 552	3,052 2,343 709	2,990 2,154 746	2,919 2,239 680	2,456 1,954 502	2,637 2,175 463	1,969	2,796 1,983 813	2,241 1,561
Pacific Coast (2) Domestic Imported	3,162 3,015 148	3,482 3,256 226	3,734	2,784	2,596	2,750	2,561	2,948	2,916
Consumption U.S. Northeast Appalachian	19,916 3,395 1,614	21,180 3,815 1,767	19,714 3,740 1,685	17,818 3,466 1,501	16,912 3,245	16,754 3,159 1,490	15,645 3,265 1,442	17,275 3,530 1,498	16,586 3,515 1,426
South Lake States Pacific Northwest (2)	2,459 9,251 3,199	9,442 2,811 3,344	8 395 2,725	7,516 2,554 2,781	7,208 2,544 3,472	7,153	6.342 2.325	6 804 2 471	6 .227 2 .396 3 .015
Inventories U.S. (3) Northeast Appelachian	4.877 1,526 335	5,622 1,644 397	4,563 1,440 372	3,780 4,063 422	2,627 869 206	2.819 700 279	2 .846 820 280	3,392 1,119	3,729 1,218 439
South Lake States Pacific Northwest (2)	1,315 670 1,031	828 1,674 1,079	1,485 974	526 1,350 419	145 986 420	218 1,088 534	293 962 491	1,313	334 995 742

(2) Converted 600 board rect equals 1 core.
(3) Kan of years, the Census, except 1941-1944 inclusive, which is by Forest Products Bureau, War Production Board Source: Bureau of the Census, except 1941-1944 inclusive, which is by Forest Products Bureau.

DOMESTIC AND FOREIGN PULPWOOD CONSUMED IN THE UNITED STATES BY DECADES, 1860-1949

Decade	Total	Dumentic	Imported	Percent of Total Imported
1866-49 1870-79 1880-89 1890-99 1996-99 1916-19 1920-79 1930-39 1940-39	1,000 conds 15 213 3,130 12,845 30,759 47,981 62,277 79,678 175,546	1,000 words 15 215 3,120 11,000 24,601 39,248 50,780 70,598 156,120	1,000 cords 1,845 6,157 8,733 11,497 9,880 19,426	14 20 18 18 11
Total	412,435	355,697	56,736	14

log imports in the Pacific Northwest. by Forest Service, U. S. Department of Agriculture from reports of the Bureau of the Census, War burd, and Forest Service.

VOLUME OF TIMBER ON COMMERCIAL FOREST LANDS OF UNITED STATES As of 1945, According to Re-Appraisal by U. S. Forest Service (In Millions of Cubic Feet—128 cu. ft. to one cord)

	All trees over 5 in. D.B.H.			Trees too small for sawtimber, large enough for pulp- wood—over 5 in. D.B.H.**		
Region*	Total ·	Soft- wood	Hard- wood	Total	Soft- wood	Hard- wood
New England	24,626	11,318	13,308	11.312	4,667	6,645
Middle Atlantic	27,359	5,376	21,963	12,128	2,545	9,583
Lake	23,200	7,000	16,200	9,500	2,800	6,700
Central	20,992	1,479	19,513	10,036	933	9,103
Plains	3,723	269	3,454	2,656	179	2,477
North	99,900	25,442	74,458	45,632	11,124	34,508
South Atlantic	35,965	17,031	18,934	13,776	4,595	9,181
Southeast	54,220	23,841	30,379	23,199	8,013	15,186
West Gulf	40,689	17,460	23,229	17,065	5,953	11,112
South	130,874	58,332	72,542	54,040	18,561	35,479
Pacific Northwest	-					
Douglas fir sub-region	117,222	115,499	1,723	26,619	25.573	1,046
Pine sub-region		28,623	34	6,681	6,663	18
TOTAL	145,879	144,122	1,757	33,300	32,236	1,064
California	44,600	44,000	material and	3,350	3,350	-
North Rocky Mountain	33,350	32,926	424	12,295	12,070	225
South Rocky Mountain		14,575	867	4,944	4,263	681
West	239,271	236,223	3,048	53,889	51.919	1,970
All regions	470,045	319,997	150,048	153,561	81,604	71.957

Volume does not include bark. Includes volume on land capable of producing timber of commercial quantity and quality and available now or prospectively for commercial use.

*See other table on page 106 for states included in regions.

*But may be saved for sawtimber. Up to 9-13 in. D.B.H. in East and South and up to 15 in. D.B.H. generally in West.

WOOD-Continued

PULPWOOD IN NORTHEAST **Demeritt Sums Up Situation** Acceptance of Power Saws

One of the most significant indications of interest by the Northeast in the production of pulpwood has been the activities of the Northeast Pulpwood Research Center, whose members include names like Armstrong Forest Co., Brown Co., Champion-International, Dead River, Diamond Match's Timber Unit, Eastern Corp., Eastern Pulpwood Co., Finch Pruyn & Co., P. H. Glatfelter Co., Hollingsworth & Whitney, International Paper, Keyes Fibre, Oxford Paper, Penobscot Purchasing Co., Pejebscot Paper Co., St. Regis, and S. D. Warren Co.

It is interesting to note that the chief interest of this group is in research and an example of their forward-looking moves is their concentrated current study on new sources of chip supply under the direction of Douglas A. Philbrook, manager. The headquarters is at Gorham, N. H., in the heart of one of the biggest Northeast pulpwood producing areas.

During "Paper Week" in New York the American Pulpwood Association held what woodlands men characterized as one of the finest and broadest pulpwood sessions yet to come to the attention of the industry

At the New York APA session, D. B. Demeritt, of Dead River Co., made a report on pulpwood forestry in New England. In part, he said:

"Too little is known about the forest situation in New England. This area has hardly been touched by the Federal For-

est Survey authorized in 1928 by the McNary-McSweeney Act, while practically all the rest of the country has been surveyed. We should have accurate figures on growth, drain, best methods of cutting, etc., before we make generalized statements that we need regulation or do not need regulation.

"Among activities that show promise of results are: 1. Northeast Forestry Foundation; 2. Forest Association Work (Connwood), Massachusetts, New Hampshire. Connecticut; 3. Free service by company foresters in marketing; 4. American Forest Products Industries, Inc., programs: "Keep Maine Green," Cash crops programs in New Hampshire and Vermont, Massachusetts Tree Farms programs; 5. Northeast Pulpwood Research Center: 6. American Pulpwood Association's training program; 7. Cooperatives do not show too much promise.

"Extension and County foresters under the Norris-Doxey Program are not doing as much as could be desired.

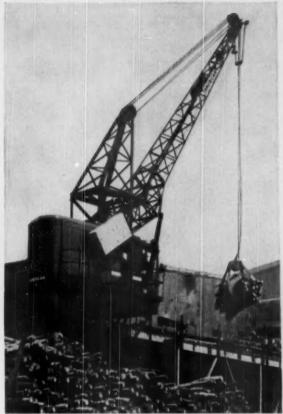
"The newest development in research in forest management is the Penobscot Experimental Forest. This forest of 3800 acres was purchased January 30, 1950, by eight paper companies and one landholding company and was leased February 1, 1950, to the U.S. Forest Service for 99 years as an experimental forest. This was the culmination of long negotiation between the government and these companies. The Forest Service, through the Northeastern Forest Experiment Station, will conduct intensive research in forest management and will make this tract a demonstration area in what to do and what not to do in forestry.

(Continued on Page 114)

LATEST RESOURCES SURVEY

U. S. COMMERCIAL TIMBER In Millions of Cu. Ft. in 1945 (By U. S. Forest Service) All Trees

	5 in. D.B.H. or over	Pulpwood size*
New England: Connecticut Maine Massachusetts New Hampshire Rhode Island Vermont	2,194 2,194 3,378	519 6,809 1,089 1,563 78 1,254
Mid-Atiantic: Delaware Maryland New Jersey New York Pennsylvania West Virginia	9,570	171 926 684 3,807 4,224 2,316
Lake: Michigan Minnesota Wisconsin	10,300 5,900 7,000	3,800 2,800 2,900
Central: Illinois Indiana Iowa Kentucky Missouri Ohio	1,412 1,919 1,904 6,826 6,041	451
Plains: Kansas Nebraska North Dakota Oklahoma (Wes	1,078	911 828 355
South Dakota (E. Texas (West)	ast) 630 159	450 112
South Atlantic: North Carolina South Carolina Virginia	9,685	5,312 3,156 5,308
Southeast: Alabama Florida Georgia Mississippi Tennessee	7,239 15,237	6,206 3,345 6,322 4,992 2,332
West Gulf: Arkansas Louisiana Oklahoma (East Texas (East)	15,187 13,933 1) 1,303 10,266	6,845 5,263 648 4,309
Pacific Coast: Oregon Washington California	60,666	16,917 16,383 3,350
North Rocky Mou Idaho	14,024 14,137 (est) 868	4,055 5,896 294 2,050
South Rocky Mou Arizona Colorado Nevada New Mexico Utah	2,924 9,617 100 1,705	468 3,744 36 421 275
All States	470,045	153,561



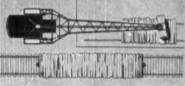
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Touch just one lever . . . the boom swings smoothly up or down . . . but the load of pulpwood in the grapple moves toward you, or away from you in a horizontal plane! That, in simplest terms, is the amazing difference in the American Pulpwood Handling Crane. Super-live, supersafe boom action makes it a wonder worker for fast, accurate, low-cost pulpwood handling. If you are in a tight spot—literally or figuratively—this great new crane can speed your work, cut your costs. Mail the coupon below for detailed information.



COUNTERWEIGHTED BOOM. To raise or lower bonn, only enough power to overcome inertia is needed. You "travel" and "spot" the load by this free botming action alone!



IN CLOSE QUARTERS, the use of a crane involves up-and-down boom action. The American Pulpwood Crane can provide this accusate spotting with obso lute



RAPID BOOM ACTION swings boom through it full are in 18 seconds. Boom cannot be dropped over-raised or over-lowered. It reverses substitute at end of are.

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News

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WOOD-Continued

"Forest protection systems have been in use in New England for over 40 years, and while they have not always been successful in stopping every fire, they have done a good job, and particularly so on these large backwoods areas. Particularly noteworthy is the Maine Forestry District organization, set up in 1909, where a special fire protection tax is levied against real estate. Loss of millions of cords by budworm in 1910-1920 probably was more serious than all the fires in 50 years.

"According to federal figures, the commercial forest area of New England is just under 30,000,000 acres. Of this 28,500,000 acres are privately owned. Almost exactly one-third of privately owned falls in large-owner class and the great majority of this is owned by pulp and paper companies. While cutting on these large holdings has been conservative, there is room for improvement. Recent developments in mechanized logging and the attendant road construction programs are gradually opening up some large inaccessible areas."

Important to the Northeast pulpwood industry was the improvement program of Maine's famous Bangor and Aroostook Railroad, whose recently elected president, Curtis M. Hutchins, is a pulpwood man himself. He heads Dead River Co., Bangor, Me., and is widely known in Northeast industries. Traditionally a logging road, the B. & A. still looks to pulpwood and other forest products for at least 26% of its 3.6 million tons carried annually, and this means 11% of its revenue. Much of the new B. & A. equipment was in the way of new pulpwood rack cars which can dump 18 cords in less than four minutes. A hundred of these were already in service when Mr. Hutchins last year ordered a hundred more. These cars were developed with Great Northern Paper Co., as was also a newsprint car. Much of the passenger improvements on B. & A. were made necessary, naturally, by increased travel of wood products people and the men who sell to the industry.

One of the remarkable developments to take place in the Northeast has been the success of the Armstrong Forest Products, Johnsonburg, Pa., in the use of chemicals for peeling the bark on standing trees before cutting. Experimented with in the South, and long under experiment by Armstrong, it is now declared commercially feasible by this associate of New York & Pennsylvania Co.

Regarding mechanization, one of the interesting trends in the Northeast has been the gradually settling down of acceptance on the power saw, with some standardization as to makes, and crystallized methods of maintenance. Several operations which were ready to give up the power saw two years ago have settled down on one or two brands, set up maintenance training programs both with

SPRUCE - FIR RESOURCES - NORTHERN NEW ENGLAND

	Stand in	Pulp Mills Present Capacity	Total Annual	Standing Co	rdage for Cord
State	M Cords	M Cords	Cut-M Cords	Mill Capacity	Total Drain
Maine New Hampshire Vermont Total	34,543 4,969 4,974 44,486	1,683 517 48 2,248	1,010 315 208 1,633	20 5 9 6 103 5 19 7	34.2 15.8 23.9 27.2

Source: American Pulpwood Association report.

its own operations and with farm lot producers.

As for protection of the pulpwood crop, the budworms infestation—hitting this time in the far West—reminded the Northeast of a similar epidemic in the New England area several years ago. The effect of the DDT aerial spray in the West was not lost on operators who had experience with the budworm. One very prominent Northeast forester for a large company said, "It looks all right to us and we'll be ready to use it if and when the budworm comes back to the East."

PULPWOOD IN SOUTH Production Levels Off APA Research Activities

After sky-rocketing to the greatest total record in 1948, pulpwood production in the Southern states in 1949 fell off under the combined pressure of ample supply at year's end and widespread "vacation shutdowns" early in the year. Mills were hard put during the year to reverse their previous condition, in some instances taking advantage of the let-up in pressure for pulpwood production to streamline their procurement organization in the woods.

In 1948, according to revised figures published by the Southern and Southeastern (U.S.) Forest Experiment Stations, pulpwood production rose to 11,-358.9 thousand standard cords of 128 cu. ft. as compared with 9,241.9 cords in 1947, an increase of 22.9%. In 1948, it will be recalled, five new mills came into production in the South and many plants already in existence effected substantial increases in their capacity. The mill picture in the immediate post-war upsurge brought Southern wood-pulping capacity to a point in excess of 50% of the United States total.

Based upon best sources available, it may be said as of date that production of pulpwood in the South during 1949 approximated 9,834.7 thousand standard cords, or a decline as compared with 1948 of 13.4%. The figure is still substantially in excess of 1947; and 1950 will reflect a further rise toward the 1948 total because of additional capacity and general economic conditions reflected in demand.

The fluctuation in pulpwood production by states is most interesting. In Louisiana, for instance, where severance tax reports may be pitted against U. S. Forest figures for 1947 and 1948, there was

a 9.6% increase in production in 1948 above 1947 but a decline of 18% in 1949 back to 777.7 thousand cords. In Mississippi, the 1948 figure rose 12.1% above the preceding period, but declined 31% in 1949 to 1.016.5 thousand cords.

Interest in research of pulpwood men in the Southeast was set down in four points when the Southeastern technical committee of American Pulpwood Association met this spring just west of Georgetown, S. C. Inasmuch as the site was Westvaco Experimental Forest on Highway 64 these four points might be considered as a focus for the pulpwood industry in that area insofar as forest research is concerned. Forest research is an interesting development in this organization which has for so long (since beginning of World War II, in fact) had to lay main stress on getting the pulpwood to the mill.

Because Westvaco Forest is owned by West Virginia Pulp & Paper Co. it is regarded as a leading forest research project because the company is noted for this phase of its operations. The experimental area embraces 20,000 acres. The four activities stressed are: 1. Forest management—wherein area is used as demonstation forest to get maximum returns in wood fibre per acre; 2. Road building—with expectation that maximum skidding

1944-3 KEEP GREEN STATES 1948-24 KEEP GREEN STATES

CONSERVATION ...watchword in the woods



For conservation of
TIME, LABOR,
RAW MATERIALS
and to cut handling costs,
mechanize with
INTERNATIONAL
POWER





Conservation is the watchword in the woods. Modern pulpwood production depends on mechanized operation to conserve raw materials, labor and time and to reduce handling costs. Today, conservation produces profits.

International Crawlers, with logging equipment and bulldozers, are essential to mechanize any conservation program. Their ability to go anywhere in the woods to haul out logs permits selective cutting and timber conservation. Their rugged construction, terrific lugging ability and allaround efficiency conserve time and labor and cut handling costs to the bone.

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WOOD-Continued

distance to usable road will be less than a quarter mile; 3. Experimental studies and operations of logging, both for pulpwood and lumber logs; 4. Emergency equipment pool, both for logging and fire, for all adjacent lands as well.

Emphasis has been put on tying in silviculture studies with eventual cutting methods and operations. Control of hardwood areas is stressed. Packaged pulpwood comes in for study also, particularly 5-foot 3-inch pulpwood in packages of 80 cubic feet, bound with two bands of steel strapping. These are handled from stump to storage yards and on the cars.

An editor of PULP & PAPER, on a trip along the Southeast coast, found interest rising in swamp logging, some in virgin timbers, and the fact that this was leading some operations into virgin timber (for example, on the Henry Ford restored plantation, and on other plantation areas where no logging has been done for this and other reasons) and, therefore, some loggers were taking a look at heavier equipment. When the editor crossed east to a Raleigh logging show sponsored by the University of North Carolina, he found many loggers frankly skeptical of several units of equipment introduced with the more average sized pine logs in mind. Their tractors and a few other units of equipment would be sturdy enough for both swamp and flat-land, but some innovations clearly had not considered virgin trees in low water areas.

However, one new piece of equipment showed an ability to get out "big ones." Also, to add to the problem, some swamp virgin timber has considerable twist which strains equipment for skidding. One answer is the Oliver Corp.'s combination of Crawler Tractor with Carco winch and Carco Sulky. This outfit is reported to be particularly effective in tree-length logging, an implied condition in swamp virgin growth. Logs are carried with winch end high.

Virgin logs from the swamps go to lumber mills as sawlogs, of course, but particularly in tight seasons a considerable percentage gets into pulpwood and a tightly inventoried mill will get a log down where the chippers will handle it, for, of course, most Southeast chippers are smaller than the far western type by identical makers. The well known tractors of regular crawler type naturally stand up as well in this rugged logging as on the flats, and show their real strength on these longer and more rugged hauls to trucks. Maneuverability of tractor and yarding equipment is a "must" because no swamp road to the "old big ones" is anything like a straight line. Such tractors as International, Oliver, Caterpillar, Allis Chalmers, and others, most usually equipped with Carco winch, are disturbing the isolated pre-Civil War forests with increasing frequency. Lack of trees of course is not the reason, but rather the wheels of progress in the South. This virgin logging is often pressured by a project which requires clearing and swamp drainage. But it could lead to slightly heavier equipment in units other than tractors on the theory that a machine built for larger stuff has a reserve of strength sure to mean longer life and easier maintenance. A few types of newer equipment built usually by firms with no previous logging experience are plainly based on Southeast operations where less than average pulpwood trees are handled. The owner would be limited to area, and it is felt generally that from now on any new designs of equipment not proved by long usage will show heavier lines and weight.

There were several trends of pulpwood production in the Southern states that showed up in the most encouraging manner. For one, the continued upward rise in industry and non-industry held lands in the "tree farm" classification is on the constructive side. Since all well-managed forest lands produce pulpwood, the effect of expansion of the millions of acres passing into advanced practice affords further assurance of supply and bulwarks capital investment in southern

mills. The upward trend in total acreage qualifying as "tree farms" reflects the work already performed by the forest products industries, and others, in getting their lands in shape to qualify for this classification.

A recent illustration of this march was the dedication of 76,000 acres in Florida out of a total of 106,000 acres held by a carrier in Florida. The land had been under "management" since May 1, 1948.

Another encouraging report in the Southern pulpwood field came from the Southern Pulpwood Conservation which showed a marked increase in percentage of wood received by the mills that originated from 78% of cutting operations classified as "desirable" type as opposed to "undesirable" clear-cutting take-all. This may be directly attributed to efforts of the industry through conservation foresters employed by the mills, whose efforts are correlated with the conservation of seedlings continues its annual progress to higher totals.

A tabulation of estimated pulpwood production for 1949, in comparison with corrected totals by states for 1947 and 1948 is produced herewith.

PULPWOOD PRODUCTION STATISTICS FOR SOUTHERN STATES (In Cords)

	Virginia	North Carolina	South Carolina	Georgia	Florida	Southeast Total
1946 1947 1948 1949°	971,000 1,025,400 1,306,500 1,153,000	709,000 765,200 926,200	1,002,000 948,400 1,108,500	1,143,000 1,215,200 1,770,600	865,000 881,700 1,221,200 1,135,000	4,711,000 4,835,900 6,330,000
1946 1947 1948		29,900 34,300	Texas 616,000 711,100 823,600	Arkansas 577,000 596,600 616,700 599,200	Louisiana 787,000 870,300 953,800 777,700	Southwest Total 1.993,000 2,207,900 2,428,400
		Tennessee	Mississippi	Alabama	Mid-South Total	All-South Total
1946 1947. 1948. 1949*		141,300 181,700	1,238,000 1,279,100 1,433,900 1,016,500	756,000 777,700 981,900 913,200	2,130,000 2,198,100 2,597,500 2,054,800	8,844,000 9,241,900 11,358,900 9,834,700

Note Because of rounding, state figures may not add up to totals.

* Authoritative estimates gathered by PULP & PAPER. All other figures from Southern and Southeast Forest Experiment Stations of U. S. Forest Service.

PULPWOOD—PACIFIC COAST "Leftovers" Create New Mills Late Forest Service Survey

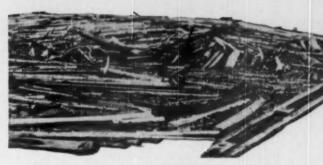
Most important pulpwood development in the Far West of both the U. S. and Canada is the increasing utilization of left-over and broken wood from the forests, slabs and trim from sawmills, veneer waste, etc., in the pulp mills. It has been a veritable "woods use revolution" and several new pulp and paper mills being built or recently put into operation from British Columbia to California's only wood pulp mill-the new Fibreboard mill at East Antioch-are based from about 50% to virtually 100% on the utilization of these wood left-overs. Much of this is quality wood and it would be fallacious to assume most mills could do just as well with inferior materials, in fact for one new alpha pulp mill this supply is not indicated.

The significance of this trend is that new mills in British Columbia, Washington, Idaho, Oregon and California are adding substantially to the region's pulp production, and yet making no great inroads into standing forests. In fact, another major trend—the increasing uses of new wood species—is making it possible to conserve for later use entire huge forests of the orthodox pulpwood species of the Far West.

More on this subject later—first, we are again able to present some up-to-date statistics on U. S. wood resources in Washington and Oregon, through the cooperation of the Forest Service Pacific Northwest Experiment Station.

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Canadian International Paper Co.

Champion Paper & Fibre Co.

Crossett Paper Mills

Dryden Paper Co., Ltd.

Great Lakes Lumber & Shipping Co.

Great Northern Paper Co.

International Paper Co.

Longiac Pulp & Paper, Ltd.

Marathon Paper Mills of Canada

Ontario-Minnesota Pulp & Paper Co., Ltd.

Ontario Paper Co.

Howard Smith Paper Mills, Ltd.

Soundview Pulp Co.

Spruce Falls Power & Paper Co.

West Virginia Pulp & Paper Co.

THEWLORAIN

CRANES for Pulpwood Handling

1950 Review Number

PULP & PAPER

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WOOD-Continued

WESTERN WASHINGTON AND OREGON PULPWOOD SPECIES -1949

Volume in Millions of Cubic Feet' of Pulpwood, other than Douglas fir in Western Oregon and Western Washington Available for Cutting' by species.' (In addition to these species there are about 65 billion cu. ft. of Douglas fir available in Douglas fir subregion.)

	Western Oregon	Western Wash.	Total
West, hemlock	5,880	14,400	19,766
Sitks spruce	754	1,006	1,760
Balsam firs'	3,538	6,066	9,546
Mountain hemlock-			
Engelmann spruc	e 811	313	1,124
Black cottonwood		139	208
Total	10,458	21,946	32,404
1 Inchedes all tower 4	Inches we	and Laurence	diameter

breast height.

* Excludes timber reserved from cutting in mu-

nicipal, State, and Federal ownership.

Compiled by Pacific Northwest Forest and Range Experiment Station from Forest Survey data adjusted for cutting depletion and growth to January 1, 1949.

'Includes Pacific silver fir, grand fir, noble fir, Shasta red fir, white fir, and alpine fir.

BREAKDOWN BY COUNTIES

Volume in Millions of Cubic Feet' of Pulpwood other than Douglas fir, in Western Oregon and Western Washington Available for Cutting by County.'

Western Washi	ington Million	Western	Oregon Million
County		County	Cu. Ft.
Clallam		Benton	29
Clark		Clackamas	1,196
Cowlitz		Clatsop	
Grays Harbor	2,374	Columbia	36
Island	9	Coox	579
Jefferson	2,183	Curry	257
King	2,071	Douglas	1,554
Kitsap	19	Hood River	
Lewis	1,929	Jackson	932
Mason		Josephine	147
Pacific	1,547	Lane	1,252
Pierce	1,086	Lincoln	386
San Juan	12	Linn	1,185
Skagit	1,605	Marion	460
Skamania	1,840	Multnomah	136
Snohomish	2,126	Polk	127
Thurston	32	Tillamook .	721
Wahkiakum	476	Washington	41
Whatcom		Yamhill	
Total	21.946	Total	10.458

¹ Includes all trees 4 inches and larger, diameter breast height.

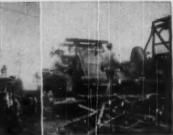
³ Compiled by Pacific Northwest Forest and Range Experiment Station from Forest Survey data adjusted for cutting depletion and growth to January 1, 1949.

Periodic pulpwood surveys in Washington, Oregon, Northern Idaho and Western Montana have been special features of Pulp & Paper Industry's Review Number each year.

This deals with the leading wood pulp region of its size in the U.S. and these figures have been revised as late as 1949 in Washington and Oregon. In no other regions of the North American continent are such up-to-date figures available. These were prepared, in part, especially for Pulp & Paper.

However, it should be noted that For-





WOODLANDS SECTION OF CANADIAN PULP AND PAPER INDUSTRY saw this equipment domonstrated at meeting last full at Stevens, Out., operations of Marethon Paper Mills of Canada. Nesco stasher at left, made by Northers Engineering & Supply Co., Fast William, Ont., is used at concentration paths where high-bead cable yording (shown in middle view) is practiced. At right is another view of stasher and loader. Stasher moves in to calid decks of tree length lags piled up to 15 ft. high, and each stasher produces from 70 cords a day up (rescrid—116 cords).

INLAND EMPIRE PULPWOOD

Data for Northeastern Washington were revised and brought up to date as of Jan. I. 1949. Data for North Idaho and Western Montana were as of Jan. I. 1945 (resurvey to be completed in 1951.)

Subregion	Engel- menn Spruce			Cotton- wood- Aspen	Total
N. E. Washington N. Idaho W. Montann	63 608 828	Millio 124 386 54	n Cub 139 1,697 242	18 10 53	346 2,701 1,177
Total	1 469	401	1 991	47	4 008

Source: Northern Rocky Mountain Forest and Rang Experiment Station, Division of Forest Economics, Missouls, Mont.

maperiment Station. Division of Forcet Economics, Musscula, Month volume inside bark of trees learner than f. The scan d. volume inside bark of trees learner than f. The state of the scan time of the scan to the scan time. I Northeastern Mushington consists of Ferry Lincoln, Pend Oreille, Spokase, Stevens and Whitman Caunties. North Idaho is the portion morth of the Salmos River; western Montana is the portion west of the Continental Divide.

est Service tables for Washington and Oregon on these pages do not include Douglas fir, of which there is about 65 billion bd. ft. in trees 4 inches and larger, dmb, available for cutting in the region. according to R. W. Cowlin, chief of the Division of Forest Economics, Pacific Northwest Forest Experiment Station, U. S. Forest Service, Portland, Ore. The Forest Service left this species out in the preparation of the table for this Review Number, because Douglas fir has beenand still is-the dominant lumber species. But Douglas fir is rapidly becoming a species of value in the new kraft mills. It already comprises 50% of raw material for the western kraft pulp and insulating board mills. Much of this is in shape of slabs from sawmills. Hydraulic barkers, being installed extensively in the West, are increasing the use of this species of wood.

Total merchantable timber in the Douglas fir region is 439,070,594 board feet (equal to about 850 million cords) according to a recent American Forestry Association survey. This includes hemlock and spruce, traditional pulpwoods. If no more timber were to grow, that's enough for 60 years, according to the AFA inventory.

Accompanying tables which show the volume in millions of cubic feet of pulp-woods—available for cutting and other than Douglas fir—in Western Washington and Western Oregon have been revised as of Jan. 1, 1949, by the Pacific Northwest Forest Experiment Station.

Timber on municipal watersheds, state parks, national parks, and primitive areas in national forests, which because of laws or declared public policy, is not available for commercial use, was not included.

The Experiment Station has brought the inventory of the forests of the majority of the counties in the region up to date through field examination.

To date reinventories have been completed for the following 34 counties: Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, King, Kitsap, Lewis, Mason, Pacific, Pierce, Skagit, Snohomish, Thurston, Wahkiakum, and Whatcom counties, Washington; and Benton, Clackamas, Clatsop, Columbia, Coos, Curry, Douglas, Jackson, Josephine, Lane, Lincoln, Linn, Marion, Multnomah, Polk, Tillamook, Washington, and Yamhill counties, Oregon. The second reinventory of Coos County was completed last year, and Clark, Cowlitz, Grays Harbor, Pacific and Wahkiakum counties are now being reinventoried for the second time.

Volumes have been made current to 1949, by adjusting the reinventories of the above-named counties and the original inventories for the other counties for depletion through cutting and increment through growth.

Approximately 45% is privately owned; 43% on national forest lands, and the remainder is on lands in county, state, Indian and Federal revested land grant ownerships.

Included in this section is revision of pulpwood resources for Northeastern Washington, as of Jan. 1, 1949, by the Northern Rocky Mountain Forest and Range Experiment Station, Missoula, Mont.

"We are working on a resurvey of North Idaho, which should be completed in 1951," M. B. Dickerman, chief of the Division of Forest Economics of the Missoula station, wrote to Pulp & Paper.

A booklet prepared by the new Washington State Institute of Forest Products, Ralph G. De Moisy, technical director, Seattle, issued this year, reveals the extent to which logging leftovers are now being utilized. While it was a survey of just four Northwest Washington counties, the figures may be considered typical. It



WOOD-Continued

shows the decrease in volume left on the ground this way:

Allen H. Hodgon found an average of 21,000 bd. ft. (42 cords) left on the ground in the Douglas fir region of Western Washington and Oregon in 1926-27. Prof. Bror L. Grondal, University of Washington, found an average of 5.156 bd. ft. (10 in. x 8 ft. and up) and 2.895 cu. ft. (5 in. x 4 ft. up) of pulpwood only Western Washington in 1940. The Hodgon and Grondal reports were published in Puls & Paper. Matson and Grantham reported a regional average of 10,000 bd. ft. per acre (8 in. x 8 ft. up) or 2,500 cu. ft. per acre (to a 4 in. top) left in 1944. The Institute's study of Whatcom, Skagit, Snohomish and Island counties (5 pulp mills in area) reported only an average of 2,800 bd. ft. (8 in. x 8 ft.) or 1,627 cu. ft. (4 in. x 4 ft. up) per acre in 1948

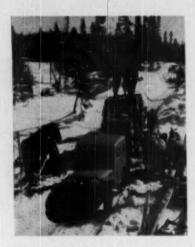
"The trend is partially accounted for by improved machinery and methods, by the establishment of more pulp mills and other wood utilization plants providing markets for previously unsaleable material and by the decreasing supply of virgin timber." says this report. "Powerful logging machinery, designed for handling the overwhelming volume of large timber, could not be applied practically to the minor quantities of small and broken trees. Much of this is true even now. A need still exists for suitable equipment of a flexible nature and markets are lacking yet in many areas.

"The war years and those following have witnessed a marked increase in salvage logging. One of the largest integrated wood-using companies in the state has developed prelogging or removal of the smaller understory trees, mostly pulp species and cedar, before the primary logging operation. Others are giving prelogging a trial. All of the large pulp companies have experimented to varying degrees with relogging following the primary logging operation. Logging machinery manufacturers and pulp companies are working together to develop new and more efficient machines for relogging. The problem is complicated by the wide range of sizes and form of salvage material both in diameter and length.

"That commendable progress has been made is evident from the fact that in 1948. 116,793,000 board feet or 7.7% of the total wood volume used by Washington pulp mills came from salvage logging operations.

"The source of the greatest volume of presently unutilized wood material in the Douglas fir region of Western Washington is that left on the ground following the primary logging operation. The cost per thousand board feet of all steps in the logging operation increases rapidly with a decrease in log size."

Crown Zellerbach, Powell River Co. Weyerhaeuser, Canadian Western (which



THE OLD AND THE NEW in Quebec pulpwood transportation. A jeep, haviling a sled load of correct wood, posses a couple of horse teams. Horses are still extensively used in costern woods, but in many camps they are being supplemented or supplemented by trucks and tracters.

plans a mill), Soundview Pulp, Puget Sound Pulp, Rayonier and other pulp firms have done much of the pioneering in developing new equipment to get out the small wood, wood broken in steep logging country with mixture of heavy big trees and small understory. This has brought into use new mobile lightweight yarding equipment, lighter weight lines, all kinds of tractors, even to the little Trail-Beetle tractors made by Western Gear Works, in gears, bundling of wood for handling in various ways, more use of power saws, and techniques for measuring, weighing and paying for small farm wood.

When TAPPI held its national convention on the Coast, its delegates toured the Weyerhaeuser Timber Co.'s St. Helens Tree Farm and saw examples of selectively cut stands and of "pilot plant" growing and cutting sections where scientific sustained yield techniques are being developed. They also saw the acceptance and wide use of the Disston two-man chain power saws in the Weyerhaeuser operations.

A new Sumner Iron Works veneer

chipper is adding new sources of wood supplies, also introduction of Carthage chippers in the woods at sawmills in California.

Just one example of how the tree-farming and salvage logging progress in the west has inspired new ideas: Glen F. logging superintendent for Hawkins. Crown Zellerbach at its Columbia Tree Farm in North Oregon, invented a steel pre-former which is a steel contrivance with a base on which are two horseshoelike upright sections with open tops in which small logs can be placed to form a shapely bundle before binding with Acme metal bands and clips. The logs then are lifted right out of the preformer with a power shovel and loaded on trucks. The shovel could also be used to place logs in the frame.

Crown Zellerbach has successfully done a great amount of aerial seeding using helicopters. P. A. Thompson, regional forester in San Francisco, predicts helicopters will replace "smoke jumpers" in fire fighting.

In a new pioneering aerial spraying project in Oregon, Crown Z. achieved a 95% kill of spruce budworm in over 266,000 timbered acres using Penn Salt Mfg. Co.'s DDT solution dissolved in oil one gallon per acre. Fifteen airplanes and five helicopters did the job.

About half a billion board feet of logs, or roughly 14% of the total log production of the province, went to British Columbia's pulp and paper mills in 1949.

On the Pacific Coast, export of pulp logs from British Columbia to Northern Washington mills has been an important matter. For years these mills had obtained substantial supplies, but these were drastically reduced in war years. Pulp logs cut on Crown grant lands are now available for export on a permit basis, and representatives of the Canadian department of commerce estimate approximately 80,000,000 feet will be exported this year, roughly the same as in 1949. Curtailment was the sharpest in 1943 when about 30,000,000 feet in pulp logs were exported. Pulp exports began to climb in 1947.

Some British Columbia companies, taking out small logs for pulp, strap them

CANADIAN PULPWOOD SPECIES — CURRENT **ESTIMATED VOLUMES**

(Provided for this issue of PULP & PAPER by the Dominion Forest Service)

Total Pulpwood Species

Equivalent Volumes in Millions of Cubic Feet of Standing Timber (Includes Sawlogs and Smaller Material)

Prince Edward Island	86,625	14,835	B1114010111-0001	385	2.045	104,090
Nova Scotia	1,378,500	2,002,554	3,042	179,748	80,895	3,644,739
New Brunswick	4,234,149	2,168,700	313,701	53,712	374,585	7.144.847
Quebec	67,138,083	37,542,918	5.090,109	138,384	2,653,765	112,563,259
Ontario	30,588,708	3,419,091	9,829,587	232,167	12,602,883	56,672,436
Manitoba			396,150	***************	2,138,590	3,335,871
Saskatchewan				And the commence of	5,640,980	7,774,145
Alberta	7,821,000		11,187,000		9,535,500	28,812,450
British Columbia	20,943,033	15,077,508	38,786,775	14,802,798		89,610,114
Total	134.783.239	60.588.801	66.073.254	15,407,394	33.029.243	309.881.931

*Probably only a minor portion of this wood will be used for pulp.

†Apprax. 300 bd. ft. equals one cord. Very little of this, however is cordwood or pulpwood. The total figure in this table, 280,949 million bd. ft. equals about 362 million cords.

2 Mostly pulpwood.

RAY SMYTHE

501-2-3 Park Bldg. Portland 5, Oregon

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MANUFACTURER'S AGENT - SINCE 1931

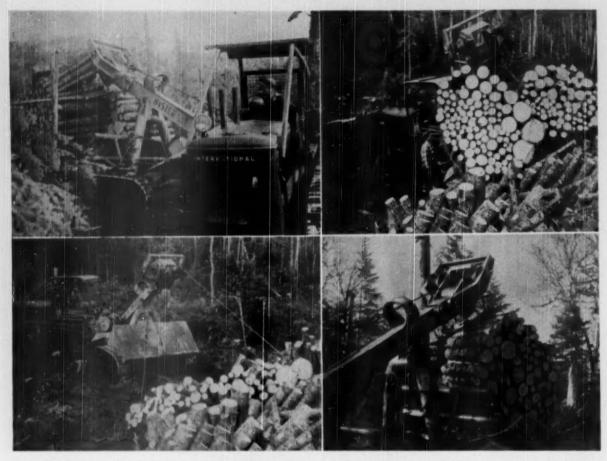
QUALITY PRODUCTS

ECONOMICALLY PRICED

BY REPUTABLE MANUFACTURERS

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- Samuel C. Rogers & Company Knife and Saw Grinders.
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 Smythe Multivat Flat Screens (Patented U. S. and Canada) Eccentric Drive—Bronze Vats—Manufactured and sold in Canada by Hydro-Turbine Company Limited, Montreal, Quebec.



OUTSTANDING FEATURE OF THIS MAGAZINE'S MONTHLY PULPWOOD SECTION LAST YEAR (March issue) was first-hand illustrated raport obtained by visiting adiror at Newfoundland woods operations of Bounter's Newfoundland Pulp & Paper Mills. He took those pictures in Hawfoundland wilds 12 miles from the mill, showing feeding and hauling of bundles of 4 ft. wood (1¼ cords to bundle) with International TD 18 tractor and Hyster arch equipped with two crab drams.

Can pick up 2 bundles at once and houl four at a time with aid of Coffing Hoists (which are geared tighteners made at Danville, III.). Work of the rugged Internationals was highly praised. Bundles are hauled from 2,000 to 4,500 ft. to river for drive to mill. Only four men needed for strapping, houling and leading, and those operations are cutting logging season in half; likewise reducing costs.

WOOD-Continued

in bundles and handle them as such until they finally reach the mill pond. Apparently the ideal method for handling small logs and transporting them to the mill has yet to be evolved, and probably no two operations would be served as well by any one method. Companies engaged in this line of activity are gradually proceeding by trial and error to determine the technique that meets their own problem best.

When Columbia Cellulose Co., the Celanese Corp. of America subsidiary at Watson Island, near Prince Rupert, starts moving pulp logs towards the mill there will be a distinct departure from the conventional method of log transportation in British Columbia, because it is planned to "drive" the Skeena River and its tributaries from which most of the wood for the new alpha cellulose mill will originate. This mill is expected to be in operation early in 1951. Unlike the eastern

river drives, however, unloading on ice will not be done as general practice; the logs will simply be dumped into the water and floated down the river under a system of control. Owing to low water, the driving will be for only four months of the year.

PULPWOOD IN EAST CANADA A Major Mechanization Market Some Leading Examples Cited

The past year was marked by continued application and experimentation in the field of mechanized logging procedure in the woods of Eastern Canada.

Progressive pulp and paper companies operating in Quebec and Ontario reported real progress in adapting mechanized yarding and transportation methods to their own special conditions.

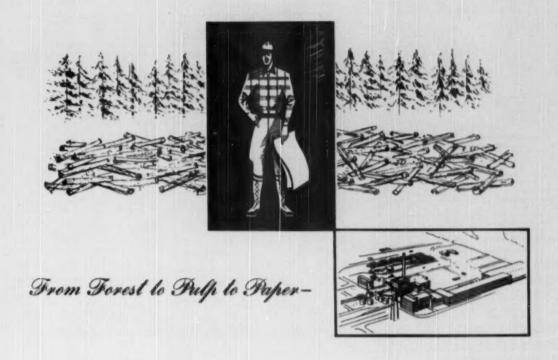
It would be a mistake, however, to draw the conclusion that pulpwood harvesting in Eastern Canada is undergoing a sweeping transformation. Even the companies that have carried mechanization the farthest admit that they are still working on the trial-and-error principle and that they can achieve the ideal only through continued experimentation. But East Canada is nevertheless a major market for light equipment.

The potentialities of this field are represented by its sheer magnitude and the importance of the pulp and paper industry to the whole Canadian economy.

In East Canada the pulpwood harvest during the 1949-50 season has been somewhat curtailed in comparison with a year ago when wood production was reduced by 20% from the record level of the 1947-48 period when 11,000,000 cords were harvested.

The Canadian House of Commons recently enacted a national forest law providing greater scope for co-operation between the national and provincial governments in forest protection and management. Under this law national forest experimental areas are being set aside.

Quebec is in the lead in progress towards attaining perpetual forest yield. About 80% of the leased forest areas in Quebec is now operated under plans ap-



The Engineer plans for your profit, peace and progress

During the last three decades, the Southern Pine and the South's abundant hardwood have

become much more than sources of turpentine and lumber. During that time they have invaded

homes and factories throughout the country in the form of kraft paper, newsprint, protective

packing, tissue and many other products for daily living. These changes, brought about by pioneering

management and the Engineer are still going on. From forest planning and control through the intricacies

of pulp and paper to the problems of personnel and markets, the Engineer brings together the many

elements that help these age-old products of nature serve man's profit, peace and progress in many new ways.



Engineers for 48 years ... J. E. SIRRINE COMPANY

A DEPARTMENTALIZED ENGINEERING ORGANIZATION SERVING WORLD-WIDE INDUSTRY

- - CANADA'S FOREST RESOURCES - -

Source: Dominion Forest Service

	1949 FORESTED LAND -In Square Miles-								•	
			P	RODUCTIV	E FORESTED	LAND				
	80774000		MIXEDWOOD HARD		HARDW			PRODUCTIVE Type s		MON-PRO- DUCTIVE FORESTED
	Merchant- able	Toung Growth	Morchant- able	Young Growth	Merchant-	Young Growth	Merchant- able	Young Growth	Total	LAND
Prince Edward Island Nove Scotia Now Brunswick	90 4600 5000	815 3180 3000	150 825 7000	130 480 5000	15 1620 1000	10 850 1000	255 7045 13000	355 4510 9000	610 11555 82000	190
Total - Maritimes	9690	6395	7975	5610	2635	1860	80300	13865	34165	190
Quebes Onterio	105745 36900	29586 29300	23041 84100	22549 67400	3199 5900	8543 10800	131985 66900	58680 108900	190665 173800	165394 63400
Total - Quebec, Ontario	148645	58888	47141	89949	9099	16743	196665	165580	364465	228794
Manitoba Saakatchevan Alberta	1835 1500 7700	9115 6450 24070	1100 2000 9360	51.20 9400 31.430	1680 2800 3620	11650 24000 16880	4615 6300 80680	25885 39850 72380	30500 46150 93060	62500 40000 37560
Total - Prairie Provinces	11035	39635	18460	45950	BT 00	52550	31595	136115	169710	140060
British Columbia - Coast - Interior	18518 85086	1958 48534	:	:	:	:	12312 23088	1958 48534	14270 71622	19555 109009
Total - British Columbia	35400	50492	-	-	-		35400	50498	85892	128564
Total - Nine Provinces	198770	155410	67573	141509	19834	71135	286180	368052	654832	497608
Percentage of Provincial Land	9.9	7.8	3.4	7.1	1.0	3,5	14.3	18.4	32.7	24.6
Morthwest Territories & Yukon	4800	22800	1000	5000	2800	11800	8000	39000	47000	76000
Grand Total - Canada	208970	178210	68576	146509	22634	82333	294180	407052	701232	573608
Percentage of Land Area	5.9	5.1	2.0	4.2	.6	2.4	8.5	11.7	20.2	16.6

^{*} Excluding Newfoundland

WOOD-Continued

proved by the Quebec government.

Most of the Eastern Canadian woodlands executives will tell you that one of the companies which has made most progress in putting machinery to work in the woods is Marathon Paper Mills of Canada, which has made drastic changes in its procedure during recent months and, as a result, gets about 50% more production. Another is Anglo-Canadian, whose logging at Forestville, Quebec, was reported getting 40% more wood per man with tractor-mounted winches and housts.

Marathon uses cable yarding by high lead and skyline as standard practice at its larger camps, and cuts its pulpwood to 100-inch size with a battery of slasher saws, some of them equipped with end-loaders. Falling and bucking crews cold deck about 900 to 1000 cords in a pile, then the slasher saws are moved in and go to work. The main idea is to build up the cold decks as fast as possible. In order to encourage cutting down to 6-inch stumps, fallers are paid on a stump diameter basis. This practice facilitates yarding as the low stumps offer a minimum resistance.

Tree lengths are skidded in either by skyline or ground skidding, depending on ground conditions. Marathon has been using Carco yarders, Skagits, Superior Lidgerwood Mundy and Timberland skidders.

Of the six camps operated by Marathon four are mechanized and two are "old style." The company's idea is to develop permanent camps which will appeal to a high type of woods labor.

The Iroquois Falls division of Abitibi Power & Paper Co., Ltd., has been cable yarding on an experimental scale near Eades, where about 50,000 cords of pulpwood are hauled each season by truck to boom storage on Lake Abitibi. For this purpose the company operates a fleet of 27 GMC trucks, mostly of 5-ton capacity, with sleighs and Dominion wheeled trailers. The company also operates two tractor hauls, with International 12-ton units, in addition to several smaller Caterpillar and International tractors. There are 22 tractors in service altogether.

One Canadian company that has gone a long way in introducing the machine to the woods is Bowater's Newfoundland Pulp & Paper Mills, where operations were viewed by a traveling Pulp & Paper editor (see March, 1949, issue, p. 71). Over a great part of Newfoundland, this company delivers wood to the Corner Brook mill by everything from truck and tractor to railroad and steamship. The company has leaned heavily towards the use of tractors in the woods operations and recently had 28 Hyster arches operating with tractors, the arches being equipped with Coffing Hoist tighteners which fa-

EAST CANADIAN PULPWOOD PRODUCTION

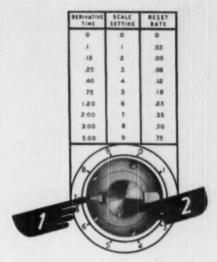
(East of Rockies, including Newfoundland)

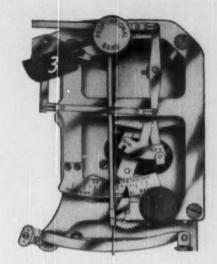
Wood-Year	Cords
1939-40	6.350,000
1940-41	7.000.000
1941-42	7.140,000
1942-43	6.070,000
1943-44	6.630.000
1944-45.	7,766,000
1945-46	8.641,000
1946-47	9,324,000
1947-48	11,162,000
1948-49	8.840,000
Source: Canadian Pulp and Paper	

cilitated the loading of two bundles at a time, four bundles to the load. Each bundle averages one to one and a quarter cords.

Bowater's operates a fleet of 15 D7 Cats as well as a score of smaller Cats and about 70 International TD-18 model and other tractors. The company's 17 Lorain cranes, manufactured by Thew Shovel Co., Lorain, Ohio, demonstrate their extreme versatility and flexibility by the various uses to which Bowater's has effectively put them.

Another big operation, which has been proceeding with mechanization rather cautiously but has demonstrated a progressive outlook towards new techniques, is Spruce Falls Power & Paper Co. at Kapuskasing, Ont. Three of its 30 woods camps are now using machinery extensively, with Caterpillar tractors equipped with Hyster towing winches and Internationals with Pacific Car & Foundry Co. "Carco" towing winches. These units are used in conjunction with sloops, the latter being flat beds of timbers with





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PULP & PAPER

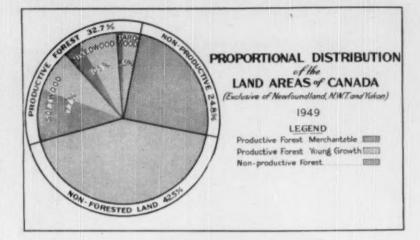
125

WOOD-Continued

runners to provide sled-like action on the snow-covered muskeg in Ontario.

Pulpwood is stacked in lets of about 1¼ cords and tractors back sloops up to the piles. One end of loading chains is anchored to the top of the tail-gate and free ends of chains are passed under the pile and back over the top where paid-out winch cable is hooked to chain ends. Then logging winches start operating, rolling the pulpwood across the loading ramp of the sloop and into a tight load. The sloops are delivered to the main-haul road, where the load is swung aboard a truck in a single sling load. Tractors handle more than 44 cords a day over snow on the strip roads daily.

Canadian International Paper Co. has made considerable progress during the past year in yarding bundled wood in hill country of Quebec, and Price Brothers & Co. has been using the light skyline yarding equipment of Wyssen (Swiss) Cableways at Matane, although this is used primarily in connection with the company's saw log operations. In the same province Price Brothers and Quebec North Shore Paper Co. have engaged in hauling pulpwood by Snowmobile on a fairly extensive scale. In Ontario, Ontario Paper Co. is slooping 4x8-ft. wood with tractor sloops, and T. S. Woollings & Sons in South Porcupine have been bundling 4-ft. pulpwood with wire for storage and rail shipment to pulp mills.



CANADIAN PULPWOOD

	C	

Year	Production	Consumption	Exports	Imports
1921 1925 1930 1940 1941 1941 1942 1943 1944 1944 1946 1946	5, 992, 461 5, 977, 183 6, 995, 016 8, 499, 922 9, 544, 699 9, 653, 574 8, 801, 368 8, 668, 546 9, 145, 673 10, 523, 236 11, 484, 522	2,180,578 3,668,959 4,741,349 5,005,063 6,996,119 7,668,386 7,667,438 7,263,155 7,177,639 7,478,508 8,684,756 9,551,050	1,092,553 1,423,502 1,330,466 1,109,873 1,551,429 1,836,392 1,987,850 1,540,592 1,499,136 1,671,298 1,855,381 1,983,980 2,317,346	94 632 19 940 47 626 81 1 714 2 379 8 209 4 133 16 881 50 508 75 969

Imports not reported prior to 1928.

Attacks Canadian Policies

John D. Gilmour, former forester for Anglo-Newfoundland Development Co. in Newfoundland, and the H. R. MacMillan Export Co. in British Columbia, has issued a pamphlet entitled "Canadian Forest Policies Are All Wrong."

Mr. Gilmour, who now is a forest consultant of Toronto, subscribes to the idea that sustained yield can be maintained successfully only when the forests are privately owned or private operators have a satisfactory guarantee of long-term tenure.

"Nowhere in the world where good forcet management is practiced can there be found a pattern of ownership such as exists in Canada," states Mr. Gilmour. "It is perpetuated and supported by the wrong people, the same who have gone a long way already to finish Canada as a forest country. Chief among them are: 1. Politicians, and some government employes; 2. The more reactionary private owners and managers and lobbyists. I hold no brief for either."

A by-product of government ownership, says Mr. Gilmour, is that the forestry profession is stifled and the public can never be informed. Foresters work for government or for private industry which by reason of dependence on licenses and leases cannot afford to offend government

Mr. Gilmour commends the tree farm movement in the U.S., and argues that in the U.S. private ownership has achieved better results than has the U.S. government in forestry.

In Canada "centralized bureaucracies have absolute control over more than one million square miles. They are not practicing forestry, and allow no one else to."

Mr. Gilmour claims there is only one province in Canada, Newfoundland, whose sustained yield capacity is greater today than it was 35 years ago, even though there have been large and increasing logging operations there since 1906. This is the only province which left forest management entirely in private hands. "If private forestry is adopted, there must be an annual tax based on bare land only and not on the crop," he said.

He recommends that:

 Various governments get out of ownership of commercial forest land as soon as possible;

2. Attention be given to protection of all non-commercial forests;

 Federal government contribute to protection of commercial forests because whereas, the owner reaps only the timber all the people enjoy benefits of water conservation, shelter, fish, game, scenery, etc.:

4. Federal government cease taxation of forest capital and allow instead, as depletion, either present value of timber used or cost of growing an equal quan-

UNDER FOREST MANAGEMENT, it is possible to take a harvest from the woods and still leave a growing forest.

DOUGLAS FIR is named in honor of David Douglas, a Scottish botanist who introduced it into Europe in 1827. Recently, with a bleached kraft process, it became a major pulpwood.

AN ACRE OF PINE TREES can produce three times more cellulose than an acre of cotton.

Stumpage Prices for Alberta Mill

Edmonton Pulp & Paper Mills, Edmonton, Alta., newsprint mill sponsored by R. O. Sweezey of Montreal, contracts with Alberta Government to pay \$1 per cord for white spruce, 25 cents for black spruce, 25 cents for basam, 40 cents for loggopel pine and jackpine. If pulpwood is sap-peeled, 15% will be added to the cost, and there is \$5.40 charge per square mile for frequarding and other minor charges. Company may remove black or white spruce, white or lodgepole pine, jackpine, balsam and poplar from designated 1.500 sq. mi. Given two years to select cutting areas, mostly joining east boundary of Jasper Park.

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NEWSPRINT SECTION

HEALTHIER SITUATION EXISTS

For the fourth consecutive year North American newsprint production set a new record in 1949, totalling 6,076,000 tons, or 4% over the previous record in 1948. J. J. Zima, statistician of the Newsprint Service Bureau, points out that the new record was fully 800,000 tons above the first of the four big years, and was 1,132,000 tons more than "the to some extent artificially stimulated pre-war production récord in 1937."

Thus, it is evident that newsprint did not suffer the slight recession which paper, in general, and pulp did in the past year.

Early in 1950, however, there was a net continental decrease in newsprint production of 14,060 tons or 0.9% in the first quarter, under the corresponding quarter in 1949. But the United States, although a minor producer, was increasing its production by 0.6% in those three months as compared with 1949, while Canada slid off 1.2%.

In its survey of the world situation, the Newsprint Association of Canada reports: "There appears to be a closer balance between world capacity and estimated demand than has existed for some years

... but all this is only a statistical balancing and does not take into account the unpleasant reality of barriers between dollar and non-dollar areas which create unbalance of supply and demand in many countries, government restrictions, and other influences." World production was placed at a record high of 9,086,000 tons in 1949, and a new record of 9,391,000 was predicted for 1950.

Interesting is the fact that U. S. consumption of newsprint in 1949 was 1,750,-000 tons more than all the rest of the world—the ratio being about 60 to 40. And the U. S. imported 3,400,000 tons more than all other importing countries together, the ratio in this case being nearly 80 to 20.

Canada was the biggest exporter—4,800,000; Finland (not counting what went to Russia) was next with 350,000; Sweden third with 245,000; Norway next with 145,000; Britain fifth with 80,000; Austria sixth with 45,000 and U. S. seventh with 34,000. Canada's exports were 1,600,000 over its 1935-39 average. U. S. was by far the biggest importer—4,600,000 tons—next being Britain with 180,000 and Australia, 155,000.

The Canadian bureau predicted U. S. imports would increase by 50,000 in 1950 but world imports would decline from 5.816,000 to 5.787,000 tons.

The flight of the newsprint industry from the U. S. is shown by the fact that in 1915 the U. S. made 76% of its total supply, Canada shipping in 24%. By 1930 the U. S. supply was divided as follows: 60% from Canada; 4% from Europe; 36% from U. S. mills. By 1949 it was 79% from Canada; 3% from Europe; 17% U. S. Newfoundland is counted with Canada, of which it is now the 10th province.

NEWSPRINT IN EAST CANADA Bowater's New Machine How Speed-ups Are Attained

Among the major events of the past year in the newsprint field of Eastern Canada has been the general, gradual speed-up of machines all along the line, and that is saying a mouthful for a section of the world already world-famed for fantastic papermaking speeds.

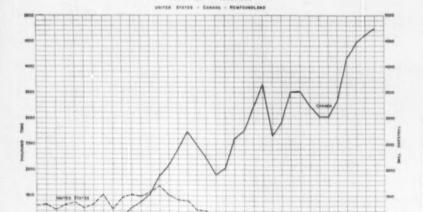
All over Eastern Canada, expert papermakers have found many devious ways of building up production without adding machines. There has been a lot of experimenting with headboxes, removing perforators, putting them back, eliminating passes, etc., but nothing radical away from conventional design. A new slice with easily adjustable upper lip was brought out by Dominion and went on many machines.

But a principal way to speed-up was by adding and improving screening ahead of the machine. A large number of new Bird screens or replacements were made. Canadian Ingersoll Rand, representing Bird in Canada, installed 21 Bird screens in just one newsprint mill alone in the past three years.

Removable and semi-removable Fourdriniers have been installed. Double suction boxes are the vogue. Additional Nash vacuum pumps are frequently seen. That, in substance, is the way these Eastern Canadian news mills have been highballing production.

New or enlarged groundwood mills went into quite a number of the newsprint mills, including Dalhousie, N. B., Iroquois Falls, Ont.; Three Rivers, Que.; Murray Bay, Que., and Corner Brook, Nfd., and these were new types of Waterous grinders—the super-Waterous hydraulic magazine upright type as at Three Rivers; or the Waterous horizontals at Murray Bay.

Bowater's Newfoundland Paper Mills' 284-inch newsprint machine went into production toward the end of 1948 and through 1949 the staff at far-away Corner Brook, under General Manager H. M. S. Lewin, Mill Manager Gerald Penney and Superintendent Andrew Killen, was gradually working up the speeds of this magnificent new machine. A PULP & PAPER editor was on hand in Newfoundland to see the dryer section run without paper at 2,020 ft. and observe final touches to the Dominion Engineering machine. It has a 1,750-ft. per minute designed headbox, Harland drive and Harland Equilox speed controls, five Bird screens set on the floor behind headbox, second fan pump. vertical flow spreader, stream-lined wier-



NEWSPRINT PRODUCTION







NEWSPRINT LEADERS AND EXPERTS, enopped by PULP & PAPER in tour of Queboc

NEWSPEINT LEADERS AND EXPERTS, anapped by PUIP & PAPER in town of Queboc and Newfoodfland (6st to right):

ANDREW & KILLIN, Gen. Supt. of Bowestor's, formerly Supt. of this Comeon, Que., bern in Someratethire, England. Responsible for storting up Bowestor's now No. 7 newsprint machine of Corner Brook, Newfoondfland.

Group who helped stort No. 7 of Bowestor's (i. to r.): A. E. Stewart, Dominion Engineering; S. J. Goodyaor, Bowester's Chief Oliez; L. V. Love, Imperial Oli Co., Itd.; E. Lefebvre, Dominion Engineering; Wilbur Legault, Deminion Engineering;

B. F. Gray, Bopco; Jack Dick, Dominion Engineering, when DONALD A. LOCHYER, Asst. Supt. in charge of No. 7, born in "Newfie" and

olse come from Baie Comoou. Worked on design of new mechine.

G. J. "JIM" LANE, Division Mgr., Boie Comeau, Que., mill of Geebac North
Shore Paper Co., who spurred his staff to push their twin high speed machines
to new records when their world's championship was challenged.

NEWSPRINT—Continued

effect of flow through headbox to wire, 54-inch double couch (biggest ever made), 50 five-foot dryers, two calender stacks, two presses instead of three, and an aluminum Ross hood with sliding panels.

Not since 1937, when the new Quebec North Shore Paper Co. mill at Baie Comeau, Que., was built by the Chicago Tribune, with twin 262-inch machines that started right up at 1,000 f.p.m., has there been a major new addition of this scope in Eastern Canadian newsprint.

Baie Comeau's world newsprint speed champions have not been resting on their laurels this past year, however. When visited by PULP & PAPER, they were rolling off news at 1,660 f.p.m. Best speeds had been 1,730 f.p.m. Best month's average was 1,650 f.p.m. Our last report for the best day for both machines was Jan. 26, 1949-520 tons, and on Jan. 20, 1949, when No. 1 made 263 tons. It is probable these marks have been bettered. G. J. "Jim" Lane, manager, heads a staff at Baie Comeau experienced in getting everything out of a machine.

Each Dominion Engineering machine now has six Bird screens, a 125-inch head on Van der Carr slices with curved lips, headbox heights have been tripled since 1937, two small forming boards are right after the main one, and we saw one of the steepest pitches on any wire, 40 inches in 44 ft. A dandy roll was added this year to one machine; it was put on the other previously. Each has a double suction box and two suction presses and double-unit Nash pumps have been added to each. Each machine has 48 dryers with Ross hoods and Ross Grewin systems.

Until Powell River made over 1,021 tons twice this year with its eight machines out on the West Coast, Canadian International Paper Co.'s Three Rivers, Que., mill with eight 160-in. machines, four Canadian and four U. S .- made, held the world's record of 955 tons for one day's production, and 917 for a month's average. Three Rivers is still the biggest newsprint making city of the world, however, with I. P., Consolidated and St. Lawrence machines having around 2,000 tons a day capacity. On the Canadian machines at I. P.'s Three Rivers mill, three new Type 3A screens have replaced four 2A's, attaining speed of 1,375 f.p.m. A new adjustable lip slice on one machine, removable Fourdriniers for four. double suction boxes, additional vacuum pumps, rubber covering on rolls, new Pope reels and additional felt dryers are other recent changes on these machines. The first totally enclosed hood, a Ross type, was installed on one of the U.S. machines.

International's Gatineau machines and Anglo-Canadian's four machines were being pushed up over 1,300 ft. to as much as 1,380 f.p.m. Great Lakes Paper Co.'s big 304-inch machine was reported pushing over 1,400 f.p.m. This is still the widest machine in the world outside of one in England.

Annexation of Newfoundland brought into the Canadian orbit last year two of the world's greatest newsprint mills, Bowater's Newfoundland Pulp & Paper Mills at Corner Brook and Anglo-Newfoundland Development Co. at Grand Falls. These two mills produced, between them, an estimated 440,000 tons of newsprint last year.

Apart from the standpoint of production, the principal change in the overall newsprint situation in Canada was in the realm of marketing. Newsprint markets overseas were further affected by the dollar shortage and currency devaluation. Shipments overseas again declined and totalled about 450,000 tons in 1949, compared with more than 700,000 tons in 1947.

It became apparent during the last few months that a new pattern in the world's newsprint markets is emerging. Practically all countries would take all the newsprint Canada could deliver if they had the necessary dollars to pay for it, but the trend today is for concentration of markets within the dollar zone.

Addressing the annual meeting of the Canadian Pulp and Paper Association in Montreal, President Robert M. Fowler emphasized that the prerequisite of a continued expansion of Canadian newsprint capacity is good profits. In that connection he answered the claim put forward by some American publishers that after Canada had devalued her dollar 10% there should have been an equivalent cut in the price of newsprint to the United States market.

"Devaluation is one of those rare human occurences," said Mr. Fowler, "that gives an extra profit to one party, at no extra cost to the other. . . . From

U. S. NEWSPRINT SUPPLY AND SOURCES

(measured by shipments taken)					Percentages of total		
from Canada	from U.S.A.	from Europe	TOTAL	from Canada	from U.S.A.	from	
367	1.184	1	1,552	34	76	0	
1.315	1.507	133	2,955	45	51	4	
1.860	1.485	113	3,458	54	43	3	
2.145	1.272	134	3,551	60	36	4	
		146	3.120	61	34	5	
		197	3.230	66	28	6	
	904	257	3.549	67	26	7	
	998		3.773	73	26	1	
				79	21	0	
		6		76	24	0	
		13		82	18	0	
				80	17	3	
				79	16	5	
				79	16	5	
				79	17	4	
	852			80	17	3	
	from Canada 367 1,315	In thousands from U.S.A. 367 1,184 1,315 1,507 1,860 1,485 2,145 1,272 1,908 1,066 2,122 911 2,388 904 2,741 998 2,666 707 2,769 855 3,563 754 4,128 858 4,350 875 4,425 950	In thousands of short for from Canada U.S.A. Europe 367 1,184 1 1,315 1,507 133 1,660 1,485 113 2,145 1,272 134 1,908 1,066 146 2,122 911 197 2,388 904 2,57 2,741 998 34 2,666 707 mil 2,666 707 mil 2,666 707 mil 2,666 707 mil 3,503 754 13 3,897 824 129 4,128 858 267 4,350 875 250 4,425 950 225	In thousands of short form From Canada From Europe TOTAL	In thousands of short tons From Granda In thousands of short tons In thousands of short tons In thousands In tho	In thousands of short form Percentages of from Canada U.S.A. Europe TOTAL	

* Estimates by Newsprint Association of Canada. Other data from NAC and Newsprint Service Bureau, New York. Canada includes Newfoundland.

NEWSPRINT-Continued

the Canadian national standpoint there can be little argument that it is highly important for any expanding exporting industry running at capacity, and with no hope of increasing its volume by price reductions, to earn the maximum number of U. S. dollars, at fair and long-established prices. . . . I should make it clear that there is no compulsion or control exercised over this industry by any Canadian government."

The industry was being called upon again this year to answer charges by U. S. politicians that a "Canadian newsprint monopoly" was responsible for an artificial scarcity. Spokesmen for the industry expressed readiness to throw their cards on the table and thus disprove the allegation which has been repeated in one form or another many times in recent years.

NEWSPRINT ON PACIFIC COAST Powell River Sets Record Port Angeles Speeds Machines

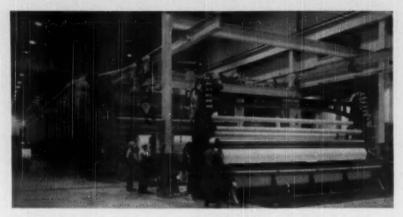
Seven mills remain in the newsprint manufacturing field on the Pacific Coast—U. S. and Canada being figured together because the British Columbia industry conditions and outlook are more similar to those in the Far Western states than in east Canada.

More than 670,000 tons of newsprint will be made by these mills in 1950—probably a little more than 1949, but only by stepping up and improving existing equipment.

It is interesting that in this group just one mill, Powell River Co., at Powell River, B. C., dominates the field so much that it has a very good chance of hitting the 300,000-mark all by itself in 1950. It produced 285,400 tons in 1949; 247,000 in 1948, and the evidence that it is still busily engaged in stepping up its almost fabulous new No. 3 machine, as well as its seven others droning out news, is in the fact that it established a new world's record for a newsprint mill on March 21, 1950—1,021.6 tons in 24 hours.

The No. 8 machine, designed for a potential 2,000 f.p.m., 226 inches wide, hit a record of 209.8 tons on March 22. It has to average over 1,500 f.p.m. to do that and this Dominion product, incorporating a number of original ideas of Powell River engineers, is the show-piece of new machines in this field, along with Bowater's latest. The Powell River No. 8 has totally-enclosed stock inlet, pressurecontrolled gravity accelerated combination flow-box and slice, and automatic controls incorporated in one integrated unit. This is Powell River's first new machine since the No. 7-226-in. machine-started up in 1930. Resident Manager Russell Cooper, a newsprint speed-man from Baie Comeau, leads an alert staff in building up the efficiency of this machine.

Pacific Mills, Ltd., at Ocean Falls, is British Columbia's other newsprint producer, with two huge 204-in. machines on



BOWATER'S NEWFOUNDLAND MILLS new No. 7—which PULP & PAPER editor witnessed stort-up—is one of biggest and fastest on news in world. Is 284 in. wide (266 in. trim) designed for potential 2,000 f.p.m., but with headbox and slice designed for 1,750 f.p.m. Built by Dominion Engineering. Ross hood with sliding penels, Marland sectionalized drive, two fun pumps, two calender stacks, Comeron winder with GE regenerative broking are features.

U. S. CONSUMPTION OF NEWSPRINT PAPER

		Lbs.
Year	Tons	Per Capita
1924	2,737,000	48.4
1927	3,445,000	58.2
1930	3,563,000	57.9
1933	2,690,000	42.8
1936	3,650,000	56.8
1937	3,830,000	59.3
1938	3,458,000	53.1
1939	3,550,000	54.1
1940	3,730,000	56.2
1941	3,930,000	58.7
1942	3,800,000	56.4
1943	3,650,000	53.5
1944	3,250,000	47.1
1945	3,480,000	49.8
1946	4,296,000	60.8
1947	4,753,000	66.3
1948	5,141,000	70.4
1949	5,529,000	74.1

Source: Newsprint Service Bureau.

that product, in a diversified operation. In the States, there are three machines at Port Angeles, Wash., a Crown Zellerbach mill, one 234-in. and two 164 inches, at peak production. Crown's West Linn mill still makes a minority quantity of newsprint, although this is now one of the nation's great coated magazine paper mills; Publishers' Paper Co. at Oregon City (formerly Hawley), is making less newsprint now than right after the group of newspaper publishers took it over; West Tacoma Newsprint Co., also owned by a group of newspapers (14 in all, in three Coast states) is stepping up its output on one machine; Inland Empire Paper Co. in Spokane, makes a portion of newsprint on its largest of three machines, 156-inch machine. And there's your seven mills making newsprint-we didn't include little Pacific Paperboard in Longview which does make an odd lot or car now and then.

There's talk, and even some plans, about more newsprint on the Coast. Of course, as is known now, the Columbine Development Co. of Grand Junction, Colo., made the winning bid of \$3.60 an acre for the Forest Service's beetle-killed and infested pine and fir in Western Colorado in late March. It was organized because of hopes of the Grand Junction Sentinel to acquire a newsprint supply for a group of papers in the Rocky Mountain area. Under terms of the contract, the 200-ton mill should be started next year. Like some other projects, the stock must be sold before it can begin to take shape.

R. O. Sweezey, Montreal financier, has signed an agreement with the Alberta government for timber concessions for a \$10,000,000 newsprint mill at Edmonton, Alberta. Under terms of the agreement, work was to commence in the summer of 1950. Edmonton Pulp & Paper Mills is the name for this project.

The possibility that Bowater Paper Corp. of England would build a mill in British Columbia seemed to brighten when Sir Eric Bowater of London, head of the firm projected a trip to the western province in the spring of 1950. His representatives have looked over sites there, and it seemed likely newsprint was the product in mind since this company operates one of the world's largest news mills in Newfoundland. Talk about a newsprint mill at Duncan Bay, B. C., had quieted down this spring, although pulp may eventually be made there by Canadian Western, according to the announced plans.

One of the notable events of the past year on the Pacific Coast was a new 24-hour record at the Crown Z mill in Port Angeles of 441.7 tons on three machines on May 24, 1949. This beat all past newsprint records here for over 28 years.

This was partly the result of gradually improved operation and "know-how" of the staff under Resident Manager Malcolm Otis, now manager at West Linn, and a few changes in equipment. Some of these changes were minor, but an important one was the addition of Beloit second suction presses. Claude Kelley became the paper mill superintendent here in '49, after 22 years at Ocean Falls. A

COOSA RIVER NEWSPRINT COMPANY SELECTS LARGE VORTRAPS

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NEWSPRINT-Continued

large hydraulic barker, for cants up to 20 ft. long, with oscillating overhead nozzle; new two-speed log haul and Drew Engineering air system for groundwood mill were among other mill improvements .

here of the past year.

The West Tacoma Newsprint Co., at West Tacoma, Wash., operated by Cellu-lose Engineers, Inc., Seattle, decided to carry on with one newsprint machine, a rebuilt Pusey-Jones. Directors voted down the proposals for a second machine. This mill, however, expects to get production up to 23,000 tons in 1950, as compared with 21,000 in 1949. The mill started up in 1946, making 15,000 tons. An additional grinder, some modern screening. and other improvements were made. This mill is now using chemical treatment for pulp to get better color, but it did well in the first years by protective coatings in piping to avoid iron contact of groundwood.

Inland Empire at Spokane installed a new 10-roll Beloit calender stack to its big machine, with SKF bearings and all new features, and it has also a modern

new hydraulic barking plant.

Overall production of Powell River Co... at Powell River, B. C., last year was greater than the estimate by some 4,700 tons. The gain was entirely in newsprint which exceeded the output of any previous year.

The annual report recently issued over the aignature of President Harold S.

Foley, stated:

"During 1949 the demand for our newsprint continued to be strong and the entire estimated tonnage for 1950 has been sold under long-term contracts." They also expect sale of all their market sulfite

Mr. Foley reports that the company has opened up a new major logging operation on the Queen Charlotte Islands to produce about 50,000,000 feet of logs an-

Powell River Co. reported an improvement in almost every phase of operation. with net earnings \$7,678,585, or \$5.71 per share, compared with \$7,307,297, or \$5.43 per share in 1948.

NEWSPRINT IN NORTHEAST Two Giants Big Producers Holyoke Bagasse Trials

As all readers know, New England and upper New York once held the great heart of the U.S. newsprint industry. But inasmuch as control of newsprint production has shifted to Canada, which now is the North American champion in paper for news, the Northeast still stands up strong in comparing U.S. newsprint areas alone. The two best reasons are a couple of quiet giants still very much alive among the ghosts of old news mills: Great Northern Paper Co. and the St. Croix Paper Co., both in Maine, and a third and much smaller operation in the

ONLY TEN U. S. NEWSPRINT FIRMS

Here is a table prepared exclusively by PULP & PAPER, which shows in dramatic fashion the flight of the newsprint industry from the U.S., as a result primarily of lack of any tariff protection in the obvious interest of low cost publishing. Actually, after the war, some plants in this country made newsprint at a loss.

If a 1913 column were added here, we would have to list 65 companies. Only ten are making newsprint now. Many have gone into higher grades of paper, in less competi-

tive fields, bringing higher returns for investment.

Coosa River Newsprint Co., built at Coosa Pines, Ala., by Kimberly-Clark and owned by a large group of papers, is the first completely new newsprint mill built in the U.S. in the last decade. The last one had been Southland Paper Mills in Lufkin, Texas, which now has added a new machine.

Coosa River and Southland are main reasons for the increase in tonnage in 1950 over 1948. The total of 985,000 tons of U. S.-made newsprint for 1950 as shown in data collected by this magazine, compares closely with the 1950 forecast of 992,000 tons by the Newsprint Service Bureau-the slight discrepancy apparently being due to minor variations in mill reports.

Gary Paper Mills, Inc., of Gary, Ind., a recent addition, is making newsprint from deinked newsprint stock

Many of the mills in this list are owned by newspapers or newspaper groups, and this is, of course, the impelling reason for their product.

COMPANIES PRODUCING NEWSPRINT IN U. S.

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	Tons, Estimated Capacit			y	
	1926	1946	1948	1950	
Alexandria Paper Co	15,000		minimum a		
Algonquin Paper Co.					
Cliff Paper Co	13.000				
Consolidated Water P. & Pa. Co.	102,000				
Coosa River Newsprint Co		**********	************	80,000	
Crown Zellerbach Corp. (and predecessors)		200,000	190,000	190,000	
Cushnoc Paper Co		200,000	200,000	200,000	
De Grasse Paper Co.					
Della Pulp & Paper Co.					
Escanaba Paper Co	370,000				
Finch, Pruyn & Co.		10.000			
Flambeau Paper Co.			14,000		
Gary Paper Mills, Inc.				15,000	
Gilman Paper Co.			***************************************	20,000	
Gould Paper Co.					
Grandfather Falls Co.	11.000	1 111-1-1119		annum or	
Great Northern Faper Co.		300,000	330,000	340,000	
Great Western Paper Co.	20,000	000,000	000,000	310,000	
Publishers Paper Co. (ex-Hawley)		56,000	75,000	75,000	
Hennepin Paper Co		00,000	10,000	10,000	
High Falls Pulp & Paper Co.	8,000				
Inland Empire Paper Co.	29,000		17,000	17,000	
International Paper Co.	323,000		21,000	11,000	
Blandin Paper Co.			4	And the same	
Maine Seaboard Paper Co.		104,000			
Manistique Pulp & Paper Co.		204,000			
Michigan Paper Co. of Plainwell			15,000		
Minn. & Ontario Paper Co.			15,000		
Nekoosa-Edwards Paper Co.					
Northwest Paper Co.					
Oswegatchi Paper Co.					
Oswego Falls Corp					
Pacific Paperboard Co.			7.000		
Peavey Paper Mills					
Pejepscot Paper Co.			9,000	20 000	
St. Croix Paper Co		75 000	29,000	29,000	
St. George Paper Co.		75,000	89,000	89,000	
St. Regis Paper Co.					
Sheffield Paper Mills			20.000		
Sherman Paper Co.	16,000		10,000		
Southland Paper Mills		SE 000	07.000	400.000	
Tidewater Paper Mills Co.	32,000	55,000	97,000	127,000	
Watab Paper Co.	17,000				
Waterway Paper Prod. Co.	17,000				
West End Paper Co. West Tacoma Newsprint Co.					
Wisconsin Divor Dance & Dula Co	95 000		17,000	23,000	
Wisconsin River Paper & Pulp Co.		000 000	454/44/4000	*TOTOGRAM	
Total.	1,739,000	820,000	899,000	985,000	

NEW MACHINE DEVELOPMENTS







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DESIGNING and BUILDING

There has recently been a rapid succession of major new developments in treating materials and improved processing methods along with increased demand for greater production speeds.

As in every previous period of the industry's

progress, WALDRON machine designs and operof the new requirements.

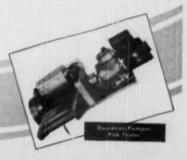
New machines had to be built—WALDRON

built them!



Full details concerning any of the new WALDRON Machines will be furnished promptly on request.





Main Office , Works

NEW BRUNSWICK, NEW JERSEY

QUALITY MACHINES SINCE 1827

NEWSPRINT-Continued

same state, Pejebscot Paper Co. of Bruns-wick, now owned by the Hearst Corp.

Although noted for its reticence as well as its production and success, Great Northern makes no effort to hide production figures and the record shows 362,000 tons for 1942, a high mark for this venerable company and one made despite low-water conditions. Not so well known is the fact that Great Northern installed two new machines in 1949, the second of which started up in December of last year. These are both Rice Barton machines which replaced two of the five 138-inch maximum trim machines. After considerable debate within the company among engineering and sales forces, it was decided to stay with the two-roll machines from which an effective combination could be worked due to the publishers' use of the smaller size as in newspaper plants dry mat work began to replace the use of wet mats with their shrinkage problem. In addition to the five 138-inch maximum trim machines (which includes the two new ones) there is No. 6 which has 143-inch maximum trim; and Nos. 7 to 10 which are 146-inch maximum

Earnings of Great Northern in 1949 were encouraging, being \$4.87 per share as compared with \$4.63 in 1948. Quarterly dividends and a special dividend in December totaled \$2.80 per share for the year, as in 1948. William O. McKay, president, that in Boston that annual pulpwood replacement was less last year than estimated and after 1950 this charge will not be necessary. This charge grew from depletion during the war. In addition to the two new machines at the Millinockett plant, there have been improvements in the sulfite mill involving cooking control, and a new screening system. Under way now are improvements for water supply for both power and log-driving.

Improvements have also been under way at St. Croix, the second largest newsprint operation in Maine, and which also maintains headquarters in Boston. Chief goal here has been for more speed on the two-roll machines, and while the exact figure is not for publication it may be said that the new speed crowds 1,300 feet per minute, may somewhat exceed it under good conditions.

The third newsprint operation, Pejebscot Paper Co., made news a few years ago when it was purchased by Hearst as a groundwood specialty mill and went into "reverse" on the general trend away from newsprint by decreasing its specialty tonnage considerably and turning heavily to newsprint. As the demand for newsprint lightened somewhat late in 1949 and early this year Pejebscot began returning to groundwood specialties to such an extent that its newsprint tonnage was confined almost to the needs of the Boston American, Hearst paper in the Hub City. This grew a rumor that Pejebscot was soon to be among the missing



VERNON L. TIPKA, who this year become the new Secy-Trees, of the Newsprint Service Bureou, New York, succeeding Royal S. Kellegg who filled the past to many years and now he retired.

NEWSPRINT PRICES

On Jan. 1, 1946, the price of newsprint under OPA was \$67.00 a ton. On Aug. 1, 1948, it had reached \$100 por price, a \$4 raise over the previous increase of \$6 or Jan. 1, 1948. Base some price is \$101, or \$1 more than port price.

	Price	Pct. Inc.		Price	Pet.
1915	. \$41.78		1942	50.00	nil
1916.	. 51.78	24	1943		9
1917.	. 63.78	48	1944	58.00	16
1918	. 64.30	54	1945	. 61.00	5
1919		90	1946	67.00	10
1921	. 111.45		1947	90.00	34
1934	40.00		1948	100.00	11
1940			1949	. 100.00	mil
1941	. 50.00	pil	1950	. 100.00	nil

newsprint mills of the U. S., but PULP & PAPER scotched the rumor as we go to press by interviewing Hearst Corp. in New York, location of the office of Robert Sternberger, president, to whom Edgar S. Catlin, vice-president and general manager at the Brunswick mill, turned the question. Once again, it was found Pejebscot is swinging upward on newsprint, not encouraging groundwood specialty papers orders. Reason: Newsprint is tight again and the outlook is tight—barring surprises—for the remainder of 1950.

The only other newsprint activity in the Northeast is the experimental run of newsprint from bagasse pulp at the Chemical Fibre Paper Co., Holyoke, Mass. This had been prefaced by a run of wheat straw newsprint in earlier months, sponsored by the Kinsey Chemical Co. of Cleveland. The latter firm is also concerned with the bagasse process for newsprint, but in this later demonstration the paper mill and Noble & Wood Machinery Co., Hoosick Falls, N. Y., joined Kinsey and others in the invitation. The use of bagasse is not a new story, and for some time the chief interest in this phase may be in foreign fields. However, the demonstration in Massachusetts was dramatized by printing an entire issue of a Holyoke newspaper on the bagasse sheet and considerable interest aroused. One expert on newsprint characterized the sheet as being "harder, heavier, more brittle and transparent" than newsprint made from wood pulp. which are not necessarily characteristics to make it desirable for U. S. presses and conditions, even allowing for low cost and improvements. Nevertheless, after years of talk and experimentation it can now be said that newsprint from bagasse pulp has been produced in an American mill and a readable newspaper edition has been printed thereon. Whether more would develop from that other than in foreign countries, cannot be said with any certainty now.

Northeast newsprint men seemed cool about the possibility of a hearing on newsprint prices which could follow the steel hearings in the U. S. Congress. If this happens at all, it would be the result of a shot fired by Samuel Eubanks, executive of the Newspaper Guild in New York. Mr. Eubanks aimed at Congressman Emanuel Celler, Manhattan representative and chairman of the House judiciary committee. High newsprint costs, the Guildsman said, was the reason for newspapers going out of business, and newspaper men and women losing jobs. The argument began with a study called "Newsprint Survey," issued by the Guild several years ago, and came to a climaxexample as Scripps-Howard eclipsed the New York Sun and combined it with the World-Telegram. Congressman Celler reacted by issuing a public charge at both Canadian and U. S. newsprint mills, strongly suggesting both were barring production expansion in order to hold up the price. Facts of expansion and improvements, expressed in plant investment, would so plainly point in a direction opposite to that of Congressman Celler's finger, that newsprint men were alert but not losing sleep. If a hearing transpired, the Canadians had agreed to come down to Washington for moral support of U.S. mills and defense of their own, even though the U.S. Congressman could not touch them.

NEWSPRINT IN SOUTH Coosa River Boosts Output Publishers Look for Third Site

The South is becoming more newsprint-minded than even back in the days when the first enthusiasm for use of Southern pine for newsprint brought the dream of a Texas mill into reality. Now a new mill at Coosa Pines, Ala., the Coosa Pines Newsprint Co., is the first entirely new newsprint mill built in the United States in a decade.

The coming into production of this mill could result in bringing this country's output of newsprint into the 1,000,000-ton range in 1950. Early in 1950, U. S. production was showing a slight increase over 1949, despite a slight recession for North America as a whole, and this was due to Coosa River.

The new machine at Southland Paper Mills, Lufkin, Texas, which had been the only Southern newsprint mill, doubled that mill's production in 1948. Bagley & Sewall made the 238-inch machine with Reliance sectionalized drive, widest on paper and fastest in the U. S. Its speed is reported at 1,600 f.p.m. The first machine, started up back in 1940, is a 124-inch cylinder machine. In Lufkin's recent expansion, newsprint production was boosted from 180 to 380 tons per day.

Eight Montague grinders, Impco deckers and doubling of Impco bleach plant capacity, two E. D. Jones jordans, Valley broke beater, Ross hood and ventilation in machine room, and Cameron winder were among other new installations.

Coosa River started making news in

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NEWSPRINT-Continued

January on its two Beloit machines, 226inch widths, built to run 1,500 f.p.m., capacity 350 tons a day. Kimberly-Clark built the mill, using some of the kraft pulp, operates the mill and is part owner with a group of Southern papers. Ross hoods and air systems on each machine; Morden Stock-Makers; E. D. Jones jordans and disintegrator; Hermann broke disintegrator; Bauer refiner; four 3A Bird screens; Nash pumps; Stowe-Woodward rubber covers on rolls; DeZurik valves and regulators; Binghein and Gould pumps; Langston rewinder; General Electric drive are paper mill units. C. E. Boiler; Dorr system; Jeffrey conveying; Merrick scales; Swenson evaporator; Ingalls tanks; PML Kamyr pulp dryer; Reliance drive; A. O. Smith digesters; Stebbins linings; Appleton Machine grinders; Impco bleachery; FMP drum barkers; Link-Belt conveying; Murray chippers are included in other major units, as reported in detail in our March, 1950,

It has been a long struggle to develop newsprint in the South. Now the newspaper publishers are busy looking, with determination, for a third site. At their last mid-winter meeting in Birmingham, the directors of Southern Newspaper Publishers Association discussed a number of proposals. The Southeast was a reported favored site—possibly in Georgia.

As far back as 1876, James Shields printed an issue of the Marietta (Ga.) Journal on paper made from rags and Southern pine. In 1916, an edition of the Asheville (N.C.) Citizens and Times was printed on Southern pine paper made at Canton, N. C. Southern pine shipped to Canada's Defiance Mills and made into paper was used by the Birmingham Age-Herald for a special issue June 20, 1921. E. W. Barrett, whose father was a Carolina papermaker, was publisher. He addressed a convention of the Southern Newspaper Publishers' Association, urging promotion of a mill. In 1934, the publishers' organization did go on record to promote such a

At the close of the 30's the newsprint mill at Lufkin, Tex., became assured through efforts of Texas forest owners, newspapers and Perkins-Goodwin Co. of New York.

Successful operation of the Texas mill gave impetus to plans for mills to serve the southeast. Selection of a site narrowed down to the Alabama Ordnance Works, at Childerburg, where power and water supply were already available. Incorporation papers were taken out in March, 1946, for the Coosa River Newsprint Co.

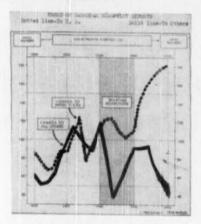
The entire output of the newsprint goes to 127 publishers. Of \$10,000,000 common stock, 51% is held by SNPA members, 25% by Kimberly-Clark, the balance held variously. Insurance companies advanced \$14,000,000 on 20-year 4% loan. Preferred stock amounting to \$5,000,000 completes financing.

NEWSPRINT EXPORTS FROM CANADA

		U.S.A.	Overseas	Total
1950		4,425,000	(ost.) *	0.
1949		4.286,153	418,499	4,704,652
1948		3,917,366	410,718	4,328,664
1947		3,685,000	545,000	4.219,000
1946		3,355,000	534,000	3,883,000
1945		2,534,000	525,000	3,059,000
1944		2,400,000	391,600	2,800,000
1943		2,545,000	265,000	2,810,000
1942		2,792,000	213,000	3,005,000
1941		2,762,000	500,000	3,262,000
1940		2,586,800	657,000	3,243,000
1939		2,206,900	452,000	2,658,000
1938		1,938,000	486,000	2,424,000
1937		2,889,000	556,000	3,455,000
1936		2,399,000	504,000	2,993,000
1935		2,052,000	523,000	2,575,000
*Consider	-		An	white Arres

to currency devaluations in several traditional markets.

*Including Newfoundland since April, 1949. (Canada's newsprint exports to the United States in 1949 were valued at \$391,305,728; to other countries, \$42,575,857.)



There is no longer any newsprint made in Mexico. Politicians' tributes and unkept promises made it unprofitable, this magazine learned on a first hand survey of the what otherwise is a growing paper industry below the border.

NEWSPRINT IN MIDDLE WEST Using De-Inked News Stock Years of Leadership Gone Forever

Newsprint is really a product of the past in the Middle West of the United States with the only mill in the entire region scheduled to make newsprint in 1950 being the small Gary Paper Mills, Inc., of Gary, Ind. But this is an interesting experiment in itself as this mill is making newsprint from de-inked news stock by the Sterling pulp process and has one Fourdrinier installed and was planning on another. J. R. Snyder is president and A. J. Thompson, general manager. It plans to make 15,000 tons in 1950.

A few small "captive" of newspapers were making newsprint up to the past year in the Middle West, also, but none of these mills are scheduled to make newsprint in 1950. These were the Kansas City Star's division, the Flambeau Paper Co.; the Peavey mill, which is also in Wisconsin, and the Michigan Paper Co.

of Plainwell, which had been making newsprint from 80% de-inked paper stock for a group of Michigan papers. Altogether, however, their newsprint production was not more than 40,000 tons a year in the short time they were doing it.

The Middle West industry has moved into higher quality papers and many of the mills which used to make newsprint are now specializing in coated book and magazine papers. When Consolidated Water Power & Paper Co., which was making 100,000 tons a year of newsprint a quarter of a century ago, went out of that field altogether, the newsprint era in the Middle West was really over. When it acquired the Wisconsin River Paper & Pulp Co. and converted its two news machines to coated paper in '46 and '47, it took another 25,000 tons a year out of newsprint. And with the building of its new stream-lined Biron Mill, its coated paper tonnage was boosted 50%.

The list of Middle West mills making newsprint formerly included such companies as The Northwest Paper Co., Minnesota & Ontario; Manistique; Nekoosa-Edwards; Blandin Paper Co.; Escanaba; Henepin; Watab and others. Long before the war, many of these had changed over to higher grades.

The biggest user of newsprint in the Middle West, the Chicago Tribune, is owner of two mills in Canada-Thorold, Ont., and Baie Comeau, Que., the former supplying The Trib and the latter primarily the New York Daily News, an affiliated paper. The Tribune and Col. R. R. McCormick, its president and publisher, have been forward-looking owners, doing much to advance the industry with experiments and new innovations in its mills. It was at Thorold that trials were made of making a straw newsprint. And, as is well known, here is one of only three mills on the North American continent where alcohol is being made from sulfite liquor.

The U. S. Department of Agriculture's Regional Research laboratory at Peoria, Ill., in the Middle West, has done a great deal to sponsor and encourage experiments in using straw for a newsprint, in order to make some possible use of the various types of straws now wasted in the Corn Belt, on the Great Plains, in the Southwest, etc. In wheat straw alone, U. S. produces about 100 million tons each year as residue.

Excerpts from Report Of Newsprint Service Bureau

The drastic decline in the relative importance of the U. S. as a producer of newsprint was noted in the annual newsprint report prepared by J. J. Zima, statistician of the Newsprint Service Bureau, New York. Taking production a quarter of a century ago as equalling 100, he said the 1949 indexes stand at 311 for Canada; 458 for Newfoundland (now part of Canada), and 59 for the U. S.

Much of his report concerns statistics

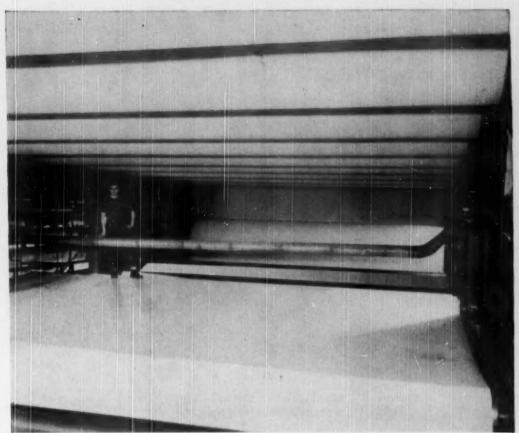


Photo Courtesy Great Lakes Paper Company, Ltd.

ON WIDEST ASTEN FELT

The man in the photograph gives you an idea of the size of a 307" ASTEN Dryer Felt running on the widest paper machine on this continent, producing newsprint at the mill of the Great Lakes Paper Company at Fort William, Ontario, Canada.

ASTEN-HILL MFG. CO. PHILADELPHIA, PENNA.



ASTEN-HILL, LTD. VALLEYFIELD, QUE.

NEWSPRINT-Continued

shown in the tables carried in this section. He commented in parts of his report as follows

"In 1949 the newsprint paper industry as a whole operated at a rate in excess of estimated theoretical capacity. This was the third successive year wherein the ratio of operations to the constantly increasing theoretical capacity of the industry exceeded 100% and was in marked contrast to the low levels prevailing in the years 1931-1933 when the average was

only about 57%

"At the end of 1949 a rather healthy situation existed insofar as overall newsprint paper inventories are concerned. As noted heretofore stocks held by all North American producers at the close of last year amounted to 132,000 tons, which was a low figure in relation to the volume of production during the year. During the first eleven months of 1949 the American Newspaper Publishers Association publishers reported stocks on hand or in transit in considerably greater volume than during the corresponding months of the preceding year with the largest increase-125,000 tons-recorded at the end of February and March. By the end of November, however, their stocks had been drawn on to such an extent that the increase over 1948 at that time amounted to only 29,000 tons, while during December a further reduction took place so that the end-of-year figure of 446,000 tons was 12,000 tons below that on Dec. 31, 1948.

"Combined stocks of these two groups at the end of 1949 amounted to 578,000 tons and were but 2,000 tons greater than at the close of the preceding year. It seems quite reasonable to assume that newsprint consumers other than those reporting to the A.N.P.A. also reduced their inventories so that a small decline in over-all stocks would appear to be

indicated.

"Although final data are as yet unavailable indications are that 1949 saw the attainment of a new high mark in total advertising expenditures in the neighborhood of 5 billion dollars.

Britain's Ban on Canadian **Newsprint Called** 'Contract Breach'

The British Government has officially confirmed that, as part of its dollar-saving drive, no newsprint will be imported from Canada at least during the first half of this year.

Previous unofficial reports were that no Ca-nadian newsprint imports would be allowed during the whole year but that Britain would take a certain amount of Canadian pulp.

A spokesman said the statement indicated compromise had been reached leaving the lat-ter half of the year open and possibility of renewing Canadian imports would be recon sidered in the light of the dollar situation at

The Government decision was expected to increase British purchases of Scandinavian newsprint.

The Newsprint Supply Co. of England said "refusal of even token imports from Canada is a breach of contract, a grievous injury to friends and a threat to the security of the free press.

WORLD NEWSPRINT CAPACITY. PRODUCTION, DEMAND, SUPPLY

(In thousands of short tons)

	Prewar	1949	1950 (ext.)
Capacity Production	10.670 8.149	9,086	10,476 9,391
Demand, no restriction Demand restrictions Apparent actual de-	8,148 nil	1,026	1,205
mand Shortage	8,148 mil	9,280	9,399

nurce: Newsprint Association of Canada. Duta of tained from producing and consuming countrie throughout the world.

WORLD NEWSPRINT SUPPLY VERSUS UNITED STATES

(Available supply in thousands of tons)

Year	United States	Rest of World	Total	Pct. in U.S.
1925	2.955	2.678	5.633	52.5%
1930	3,551	3.494	7.045	49.6
1935	3.230	4.406	7,636	42.3
1939	3.534	4.535	8.069	43.8
1946	4.330	2.990	7.320	59.2
1948	5.253	3.288	8.541	61.5
1949*	5.475	3,586	9.061	60.4
1950*	5,600	3.724	9.324	60.1

Source: Newsprint Association of Canada 1949-50 NAC estimates.

CANADIAN NEWSPRINT COMPANY REVENUES

From data reported by companies comprising 80% of Canadian newsprint capacity and extended below to 100% by the Newsprint Association of Canada. Figures show the disposition of operating revenues among main categories of expenditure in four years, 1945-48.

	Millions of dollars	Pat.
Payroll, materials, delivery Interest on borrowed funds Teams Depreciation reserves Expansion, woodlands, held for contingencies	\$1,559 44 194 131	72.4% 2.1% 9.0% 6.1% 6.1%
Dividends	92	- maringana
Operating revenues	\$2,152	\$100.0%

BOOK PAPER AND NEWSPRINT and U. S. Commodity Prices

Index numbers with 1926 as 100. General U.S. Commodities and U.S. Bookpaper indexes are thore issued by U.S. Dept. of Labor. Canadian newsprint ledex shows yearly averages of published Canadian contrast prices for delivery at New York, as listed below. This data was issued by the Newsprint Association of Canada.

	General U.S. Commod-	U.S. Bookpaper (magazines)	Canadien Newsprint Delivered N.Y.	
	ities index			dolları
1920	154		161	\$112.60
1926	100	100	100	\$70.00
1929	95	93	89	\$62.00
1932	65	70	69	\$48.33
1935	80	85	57	840.00
1938		91	71	\$50.00
1941	87	109	73	\$50.00
1944	104	116	83	\$58.00
1947		160	126	\$88,50
1949*	152	175	143	\$100.00

" Most recent

Mummy Wrappers Were Used for Paper

That old account book in the attic or some of those old letters you prize as heirlooms may have been made from Egyptian mummy wrap-

So serious was the shortage of rags used in making paper in the United States in the 1850's that some New England paper mills im-ported boat loads of Egyptian mummies for their linen wrappers.

FIRST ENGLISH LANGUAGE daily newspaper-the Daily Courant-was established in London in 1702.

ON THE FIRST ARBOR DAY Nebraskans planted over one million trees.

RAYON for draperies and furniture covering is made from wood pulp.

WORLD NEWSPRINT PRODUCTION

Country	(Ave.)	1949	1950 (mat.)
Canada	. 3,336,500	5,150,000	5,110,000
U.S.A.		900,000	975,000
Argentina		2,500	5,000
Brazil	4,000	33,000	35,000
Chile		8,250	8,250
Britain		500,000	600,000
Finland		386,000	430,000
Norway		172,000	172,000
Bweden		362,000	363,000
Belgium		72,000	72,000
Denmark	1,800	2,000	2,000
France		309,000	342,000
Germany-E. Zone		100,000	100,000
-W. Zone	166,000	100,000	106,000
Necheclands	99,285	88.000	90,000
Paland		51,000	55,000
Portugal	. 0	1,900	1,900
Russia		365,000	375,000
Switzerland	34,500	50,000	55,000
Austria	70,550	75,000	75,000
Bulgaria		4,000	4,000
Czechoslovalna	42,800	50,000	50,000
Hungary	5,295	6,000	6,000
Hoomania		4,500	4,500
Italy		88,000	105,000
Spain		21.000	21,000
Turkey		7,700	7,700
Yugoslavia		7,000	7,000
Kaypt		1,100	1,400
India		0	33,000
China	. 0	1,000	1,000
Japan		125,000	135,000
Kores		10,000	10,000
Australia		33,008	33,000
Total	8.149.470	9.085,950	9.390,750

Source: Newsprint Association of Canada.

CANADA'S NO. 1 INDUSTRY

There are 21 companies in Canada producing newsprint; some large, some small. They operate 38 newsprint mills, ranging in capacity from 10,000 to 250,000 tons a year. About 80% of total capacity is in Ontario and Quebec; about 50% is in Quebec.

Newsprint is Canada's largest manufacturing industry and chief export commodity. The in industry and chief export commodity. The industry is semi-public because 90% of its wood is owned by the public and is used under governmental supervision. This Canadian industry is also one of the world's greatest enterprises. Its present mill capacity of 5,226,000 tons a year is four times the capacity of any other country and is equal to the combined capaci-ties of the United States, Britain, Sweden, Norway and Finland.

CANADIAN NEWSPRINT CAPACITY AND PRODUCTION In thousands of short tons.

	Rated Idle Opera		erating
	Capacity	Capacity	76
1925	1,715	193	88.8
	3,600	1,096	69.6
1932	3,840	1,926	49.9
1935	3,914	1,163	70.3
1937	3,883	235	93.9
1940	4,368	949	78.3
1943	4,315	1,332	69.1
1945	4,301	1,042	75.8
	4,279	136	96.8
	4,350	nil	101.1
2040	4,478	nil	102.2
1949°	5,113	nil	101.2
1950°	5,226	nil	**97.2
	A CONTRACTOR OF THE PARTY OF TH		

Source: Newsprint Association of Canada; 1949-1950 NAC estimates from company reports; including Newfoundland, beginning in 1949. * To date in 1950.

Finnish-English Competitors

For the third year in a row, a sports competition was held between teams of the United Paper Mills of Finland and the Albert E. Reed & Co. mills in England. Soccer football and track teams from four United mills went to Aylesford, Eng., this year as they did in '47. In '48 the events were at Myllykoski, Finland.

Sir Ralph Reed, chairman of the board of Albert E. Reed & Co., which operates three mills with about 20 paper machines, is chief of the State Paper Control in Eng-



The right kind of chain does it

Many tough conveying jobs in the Pulp and Paper Industry are made easy once Jeffrey Engineers get the call. They can offer a complete material handling service-rugged and dependable units engineered to cut costs and speed production through various processes.

Pulpwood Conveyor shown here - of simple and economical design-is equipped with Jeffrey PW 132 Chain noted for its extra heavy wearing qualities. Here again Jeffrey-equipped means efficient operation. Take advantage of Jeffrey experience and specialized engineering.

Equipment for the Pulp and Paper Mill:

Belt Conveyors Chains Chip Conveyors Crushers (salt cake) Elevators (bucket) Feeders (lime - selt cake) Log Houl-ups Re-chippers Screenings Grinders Shredders Unloaders (barge)

Send for Data

MANUFACTURING COMPANY Established 1877

809 North Fourth St., Columbus 16, Ohio

Baltimore 2 Birmingham 3 Boston 16 Buffalo 2

Chicago Cincinnati 2 Cleveland 13 Denver 2

Harlan Houston 2 Huntington 19

Milwaukee 2 Jolfrey Mfg. Co., Ltd., Head Office & Works: Montreal Pittsburgh 22 St. Louis 1 Solt Lake City 1

Processing and Mining Equipment

Complete Line of Material Handling,

LABOR RELATIONS

WAGE AGREEMENTS; EMPLOYE BENEFITS

LABOR IN NORTHEAST The Continental Case Riegel and West Va. Policies

Even though surrounding conditions were not applicable to a majority of mills in the area, Continental Paper Co., Ridgefield Park, N. J., broke the biggest labor story in 1949-1950 in the Northeast industry. One of the first (if not the first in this industry) to adopt a type of bonus participation by "production savings," proved successful in other fields, Continental was in the spotlight when trouble arose with United Paper Workers of America (CIO). Finally William J. Alford, Jr., president, decided to shut down -possibly, he said, forever; but at any rate, indefinitely. On February 6 he ordered the dismantling of machinery for a prolonged shutdown and later left for England. As pointed out by one observer in the manufacturing field, "Continental was one of the few operations in the business able to fight it out, and to my mind the whole paper and board industry owes Mr. Alford and his associates a debt. of gratitude.

Whatever the merits of the case, it is obvious that Continental put UPW on the back-track. Among the terms the latter accepted late in March as conditions under which new operations were to begin were these: that the international representative of the union involved should no longer advise affairs of the local nor contract or conduct any business with Continental (he was convicted of assault on company officials); that the president of the local shall resign his office and a new president be appointed, due to strained relations involved; that all questions of collective bargaining and contract negotiations be postponed for three months; that pay scale remain same as June, 1949; that pensions and insurance benefits, discontinued during the strike, remain suspended to be discussed at a later date.

It had taken 37 weeks to break open the issue, and Mr. Alford's statement from England, announcing his decision to reopen the mill, stated that he had received assurance that "irresponsible labor leaders who had caused the strike' would be removed from power and that he was starting up again because of understandable pressure from Jersey civic committees, employes, and the pleas of the local press. He made it clear, however, that the reopening of Continental was in effect the birth of a new business, and warned that the "wounds" of a nine-months strike might yet force Continental to close doors once again. That decision, he said, now lay within the hands of those returning to work.

The spring of 1950 was a relatively quiet period of good times, and at this moment the future did not look as if it held any insurmountable labor problems. John P. Burke, president and secretary of the International Brotherhood of Pulp, Sulfite and Paper Mill Workers (AFL), told Pulp & Papers from his office at Fort Edwards, N. Y., that he did not care to make any statements (late in April) "because we are starting our important negotiations next week." This was essentially the same attitude Mr. Burke took last year at the same time, and in essence the pattern of the immediate future seemed about the same.

Diamond Match at Springfield, Mass., granted a 3-cent an hour increase which was ratified in April by local members of Federal Labor Union, AFL; discussions had run since last fall and the new contract took effect May 1 to run until May 1, 1951.

As for fringe benefits, they have been

Above-Average Industry Pay For Pulp and Paper Employes

One of the significant developments in the United States pulp and paper industry is that the hourly pay of employes has passed that of all industries of the nation combined.

The table below shows what has happened. Un to 1947, the pulp and paper industry was slightly behind the average of all industries. In war years, it could hardly be expected to keep pace with "cost-plus" and favored war industries, despite the belated recognition of the essential nature of pulp and paper by government after shortages in paper and pulp developed.

But from 1947 on, the pulp and paper average has been above the general factory average.

TREND IN AVERAGE HOURLY EARNINGS U. S. PULP AND PAPER INDUSTRY

U. S. FACTORY AVERAGE

(Source: U. S. Bureau of Labor Statistics)

	Pulp & Paper Hourly Earnings	U.S. Factory Hourly Earnings
June 1939	8.618	8.631
Dec. 1939	631	.652
June 1940	614	.662
Dec. 1940	660	676
June 1941	.716	.732
Dec. 1941	.738	.783
June 1942	.797	.845
Dec. 1942	.829	907
June 1943	.851	959
Dec. 1943	.863	.995
June 1944	.864	1.017
Dec. 1944	.904	1.040
June 1945	.906	1.058
Dec. 1945		994
June 1946	1.038	1.084
Dec. 1946	1.119	1.148
une 1947.	1.231	1.226
Dec. 1947	1.297	1.276
June 1948		1.316
Dec. 1948	1.404	1.400
June 1949	1.410	1.405
Dec. 1949	1 423	1.410

well developed for many years in the Northeast. Riegel Paper Co., for example, has long enjoyed unusual labor relationships without organization and it is interesting to note that for many years Riegel has had pension policies for both salaried and hourly paid employes that compare favorably with many major industries. Twenty-two were retired on pensions in 1949 to make a total of 139 since the plan began, with 70 living at the end of 1949. Benefits under group insurance were enlarged, while the company established larger sickness and accident benefits than prescribed by the New Jersey Temporary Disability law which became effective January of 1949. Riegel personnel men constantly study wages in the industry and nearby companies to insure comparable earnings. A chart prepared this year by Riegel indicates that average weekly earnings of employes have tripled while the cost of living increased 67% between 1939 and January 1, 1950.

Human relations-rather than labor relations-play a growing part in the Northeast picture. Said George Olmsted, Jr., president of S. D. Warren Co., this year elected chief of APPA: "Our company's greatest assets are the character and soundness of our people, and the nature of the community (Westbrook, Me.) in which our largest manufacturing plant is located." Mr. Olmsted is particularly enthusiastic about the dinners held last year for 50-year employes of Cumberland Mills, and about the "open house" in the fall of 1949 when 14,000 visited the mill, many of them employes and their guests to whom they showed the operations.

In his letter to shareholders, Mr. David L. Luke, Jr., president of West Virginia Pulp and Paper Co., takes due note that the company is in "the process of working out with employes a practical settlement of the sensitive 'social insurance' issue." In the case of this organization, several unions are involved: AFL at Charleston; the CIO at Covington, Luke and Williamsburg; and District No. 50, UMW, at Mechanicville; and a non-organized group at Tyrone. As Mr. Luke points out, "People forget that certain costly and important forms of social insurance, now taken for granted, have been in effect for years."

LABOR ON PACIFIC COAST U. S.—B. C. Wage Agreements Safety Conferences Succeed

The unique industry-wide Pacific Coast Pulp and Paper Labor-Management Wage Conference was being summoned again in Portland, *Ore., as this issue went to press. Last year the conference added one more year to its 15-year record of



SPECIAL "Paint Technology" protects this paper giant.....

Union Bag and Paper Corp., outstanding specialists in the manufacture and fabrication of paper products, has long relied on ERROTE engineers for special problems involving construction and maintenance paints.

They, like many other firms, have recognized that selection of the proper industrial paint to fit a specific need requires highly specialized skill.

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ERROTE field men have the technical background and experience which qualifies them to carefully study and intelligently analyze every paint maintenance problem. And — after analysis — ERROTE men have the organization to correctly fabricate the exact paints required to do the job.

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One of our Error field men will gladly consult with you, at your convenience. He will recommend exact ways in which Error industrial paints can protect your plant and equipment . . . establish a complete Maintenance System geared to your operation. Your inquiry promptly and carefully considered.

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THE EARL PAINT CORPORATION

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Air view of Union Eag and Paper Corporation plant at Sevenneh, Georgia — one of the largest and most medern units in the industry.

ASK US... about the naw ERROTI SPECIAL PRINTER for all steel ourfaces and our new PINISM COAI (gray or block) for general use Both are highly resistant to corre sive chemicals found in Sulphate anser mills.

Also complete recommandations

ERKOTE PAINTS FOR INDUSTRIAL MAINTENANCE

1950 Review Number

PULP & PAPER

141





GEORGE OLMSTED, JR., (loft) Provident of American Paper and Pulp Association, says: "Our company's (5. D. Warren Co.'s) greatest assets are the character and secondness of our people'—more than 50 percent have been with the company 5 years. He stressed importance of mill "apon houses" and amplaye dinners.

R. S. WERTHEIMER (right) Visu President and Manager, Languiew Fibre Co., which had railed up phenomenos 2,000,000 man-hours without lost-time accident by early spring this year. Its personally directed mill safety compaign. He is also Secretary-Treasurer of Pacific Coast Association of Palp & Paper Manufacturers, whose wrage conference is discussed in this section.

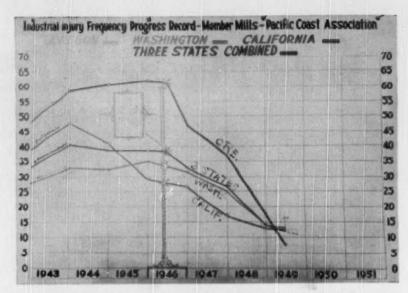
LABOR-Continued

successful and peaceful negotiations between the management association representing 35 mills and the AFL unions, representing over 15,000 employes. Only once was peaceful labor-management relations on the Coast broken and that was by an unsuccessful CIO strike in one mill during the war, attempting to supplant the AFL, and therefore, it was a strike that this conference could not have averted.

The Pacific Coast wage structure, highest in the industry anywhere in the world (cost of living in some Coast areas has also been rated officially among highest in the nation and, therefore, the world), was unchanged as a result of the final meeting last year, held in Portland in September. Extended until June 1, 1950, was the basic wage rate for men of \$1.421/2 an hour; for women, of \$1.161/2. The average hourly pay for this period was \$1.761/2, a record high. Referenda in 43 locals in Washington, Oregon and California mills confirmed this agreement, which also included liberalized vacation and holiday and night differential pay.

A new wage agreement was signed in March, 1950, by five pulp and paper mills of British Columbia with the AFL unions, liberalizing vacations and increasing basic wage from \$1.06 to \$1.12 per hour, effective May 1, 1950. This compares with the \$1 base in Eastern Canada where industry negotiations were to be held this spring.

The annual series of Pacific Coast AFL labor-management safety conferences were held again in late 1949. Sixteen mill managers and a couple of vice presidents attended the one in Bellingham, for Washington state, in December, and this was evidence of how seriously management is taking the safety campaign. The Oregon and California meetings similarly had top management



DOWNWARD "DIVES" OF THE ACCIDENT FREQUENCY LINES for Pacific Coast mills after the summer of 1946, indicate what the annual series of industry-wide Joint Labor and Management Safety Conferences have accomplished. The introduction of more methonized equipment may have helped, but mill management and union men gave most credit to the conferences. Here's proof of how these conferences have succeeded --Oregon's line being pulled down from 38.4 (per million man-hours) in mid-1946 to only 8.3 in mid-1949; Washington's from 32 to 13.3; California's from 27 to 12.7 and all three states from 37 to 12.20.

PRODUCTION WORKERS AND WAGES IN U. S. PULP, PAPER AND ALLIED PRODUCTS INDUSTRIES

Year	Average number of wage earners (Thousands)	Total dollar wages (Millions)
1899	 94	36
1909	 145	68
1919	 208	213
1929		287
1939		310
1947.		953
1948		1.063
1949	 382	1.111

Preliminary. Source: U. S. Bureau of Labor Statistics.

STATE OF OREGON Pulp and Paper Industry Payroll Data

Year	Payroll	No. of Employes
1932	\$1.896,692.09	1,681
1937		2.861
1939		2,044
1941		2.577
1943		2.695
1945		2.945
1946		3.233
1947	\$11,978,117.03	3.331
1948		3,529
1949		3.405

Source: Data from Oregon State Accident Commission plus information obtained from certain mills

Data from July 1, 1929, to June 30, 1931, not available.

as well as top union men conferring side by side.

Since these conferences began—from mid-1946 to mid-1949—accident frequency for Coast mills has been reduced sharply—Oregon from 38.4 per million man-hours to only 8.3; Washington from 32 to 13.3; California from 27 to 12.7 and all three states combined from 37 to 12.2.

WASHINGTON STATE Payroll Data of Pulp and Paper Industry

Year	Payroll	Man- Hours	Increase or Decrease Compared With Preceding Year Payroll Hours
1927	84,855,526	7.710.848	contents extenses
1939	11,919,832	14,197,262	
1940	14,517,505	16.905.387	+21.79% +19.079
1941	17.236.948	18.234.058	+18.73% +7.869
1942	20.724.118	19.642.765	20 23 % 7 73 9
1943	19,879,950	16,787,877	-4.07% -14.53
1944	21.865.943	17,411,977	+9.99% +3.72
1945	21 .995 .846	17,491,211	+ 59 + 46
1946	25,083,023	17.612.908	+14. % + 01
	\$32,611,322	19.551.473	+30.01 +11.01
	\$37,275,195	20.530.085	+14 30 % +5.01
	\$36.853.575	19,597,454	-1.13% -4.549

Source: Department of Labor and Industries, State of Washington.

Longview Fibre Co., in winning the Governor's safety trophy for the industry in Washington in 1949, went on to pile up a phenomenal record of over 2¼ million man-hours without a lost time accident by this spring.

Here are payroll data on Washington and Oregon mills, a feature of the North American Review Number for many years. This represents a highly concentrated segment of the North American industry and the mills, along with those in California, which participated in the Portland wage conference.

LABOR IN MIDWEST Safety Is Being Emphasized What Mills Do for Employes

Evidences were on every hand that the major paper and pulp mills of the Middle West were recognizing programs that make for good employe relations, and were doing something about it.

The men in the mills of the Middle West were kept as safety conscious and as guarded against accidents as any in-



BEHIND YOUR DRYER FELT

A creel of premier quality cotton from California's San Joaquin Valley, a major factor in providing the long life and high porosity for which CALCOT dryer felts are noted.

Manufactured by

CALIFORNIA COTTON MILLS

Division

National Automotive Fibres Inc. Oakland, California

Distributed by

Pacific Coast Supply Company
PORTLAND SAN FRANCISCO

LABOR-Continued

dustry using a lot of machinery, and more than most.

In 1949 more attention than ever was paid to safety contests. Management not only sponsored the programs, but came through with, and participated in, parties and gatherings to celebrate safety records well accomplished.

Typical of awards was the plaque for the best record among Class A mills en-tered in the National Safety Congress, won by Kimberly-Clark's Lakeview mill of 1411 employes. Another was the big party for employes and families staged by Thilmany Pulp & Paper Co. to celebrate receiving of plaques and to urge the men to continue a perfect safety record, which was rolling up 2,000,000 manhours without a lost time accident this

Nekoosa-Edwards Paper Co. announced again that it will grant cash sums of \$300 each to all its employes building houses for their own occupancy, in either Nekoosa or Port Edwards, Wis. Since 1946, 62 employes have received cash grants under the plan. Nekoosa received 33 new homes and Port Edwards 29.

Besides the cash grant; Nekoosa-Edwards helps the men buy building materials at lower costs through mass buy-

But Nekoosa-Edwards has gone further than that to make living in a mill community a pleasure. It cooperated with the village of Port Edwards and built a 10-unit handsome and modern shopping center. The center has a bank, a municipal building, medical building and retail establishments. It was a big addition to the community.

Many of the mills wanted to see their employes get on and cooperated with them in educational and technical courses and various schooling sessions. The Ohio Boxboard Co., for one, has a plan where it refunds specific tuition expenses to any employe who enrolls in night classes and correspondence courses.

"Better Employes for the Future." might well be the heading for comments about the new Pulp and Paper Technology school of Western Michigan College, Kalamazoo, Mich. Contributions in time, money and equipment from mills and allied supply houses have exceeded all expectations. Before long the mills will have their chance at a crop of new men who will be fundamentally ready to step in and be more useful employes.

Looking back further than just 1949, Thilmany Pulp & Paper made some interesting observations. It took a decade of figures published by the Pulp & Paper Manufacturers League for the Lake States. Industries listed were paper, lumber, coal, retail, auto and others.

In 1939 the average of all industries listed was 67.7 cents per hour. Thilmany was paying 59.67 cents, very close to the average of other pulp and paper mills. At the end of 1948, the average of all the in-

CANADIAN PULP AND PAPER PAYROLL DATA

	Total	Employes	Average	Employee	Average	Wage	Living	Salarios-
	Employee	On Salary	Salary	On Wages	Wage	Index*	Index	Wagos
1920 1939 1941 1943 1945 1946 1947 1946	31,016 37,154 37,020 39,996 44,967 49,946	2,669 4,382 4,970 5,384 5,981 6,910 7,706 8,056	\$2,449 \$2,482 \$2,600 \$2,723 \$2,803 \$3,033 \$3,411 \$3,776	28,629 26,634 32,164 31,636 34,015 38,057 42,240 43,858	\$1,352 \$1,271 \$1,577 \$1,787 \$1,813 \$2,103 \$2,443 \$2,764	109.5 102.9 127.7 144.7 151.7 170.3 197.8 223.7	150 S 101 S 111 7 118 4 119 S 123 6 135 S 155 0	\$ 45, 253, 893 \$ 44, 737, 739 \$ 63, 677, 818 \$ 71, 199, 422 \$ 80, 462, 644 \$101, 364, 636 \$129, 477, 995 \$151, 662, 761

ook abor not included. Wage and cost of living indexes: 100 equals 1935-39 average. Latest available. urce: Dominion Bureau of Statistics.

CANADIAN INDUSTRY PAYROLL DATA In Pulp and Paper Mills

	No. o	Weekly	Average Weekly			June 1, 1941 as 100 p.c.		
	Employes Dec. I 1949	and Wages Dec. I 1949	Dec. 1 1949	Dec. 1 1948	Dec. 1 1947	Employment Dec. 1 1949	Payrolls Dec. 1 1949	
Maritime Provinces Quebec Ontario British Columbia New Brumwick Manitoba	38,540 52,211 9,457 4,012	\$297,149 \$2,005,795 \$2,630,697 \$502,778 \$211,825 \$189,577	\$48 63 \$52 04 \$50 39 \$53 16 852 80 846 16	847 46 \$50 40 \$46 10 \$53 72 852 31 \$43 48	\$43.00 \$45.77 \$43.36 \$47.01 \$46.63 \$39.10	116.2 126.03 151.6 147.0 118.5 144.4	214.7 227.3 250.4 235.8 225.9 221.1	

Source: Canadian Department of Labor

dustries was \$1.417 per hour and the paper classification was running practically identical to the general average figure. The greatest percentage of increase of all in the 10 years was enjoyed by the paper mills.

LABOR IN EAST CANADA Concessions in Ontario: Quebec Talks Held in May

Wage negotiations for 1950 in the pulp and paper industry in Eastern Canada were still proceeding in May, but a settlement reached between several of the larger Ontario companies and their employes late in April was expected to set the general pattern for the year.

For these Ontario mills labor rates were generally increased 5%, and the base rate previously applicable of \$1 an hour was boosted to \$1.05.

The papermakers' wage schedules have been based on speed and width of the machines they operate and for them the base rate was also increased 5 cents an hour.

Labor won a new concession in Ontario this year-a night shift differential of 3 cents an hour, covering the working period of 8 p.m. to 8 a.m. This differential has been effective in Western Canada for some time at 5 cents an hour, but few Eastern Canadian mills have paid it and it is now generally applicable in Ontario with the signing of the 1950 contracts.

Another new feature of the contracts is the granting of three weeks' vacation with pay for employes of 15 or more years' service.

Negotiations in Eastern Canada's fine paper mills and in Quebec, where approximately the same conditions applied as in Ontario, were still continuing during the first week in May.

ONE-FOURTH of the area of the U.S. is commercial forest land.

OREGON leads the nation in lumber production but Washington leads in pulpwood and pulp.

CANADIAN LABOR STATISTICS

As of Dec. 1, 1949: Number of employes, 47,063.

Aggregate weekly salaries and wages. \$2,715,404.00.

Average weekly salaries and wages, \$57,70. index number of employment based on June

1941, as 100%, 123.5%. Index number of payrolls based on June 1, 1941, as 100%, 225.7%

Source: Dominion Bureau of Statistics

Whittemore, Williamson **Address NPTA Meeting**

Laurence F. Whittemore, Boston, exrailroad chief and newly elected president of Brown Company of Berlin, N. H., and LaTuque, Canada, refused to comment or instruct on the paper industry to one of the many packed audiences of the annual National Paper Trade Association in March at the Waldorf-Astoria.

"I am too new at it," he pleaded-but then went on to show that he could well instruct and comment on the difficult business of being an American. Concluded the Bostonian in a straightforward attack on human weaknesses in govern-

"In the final analysis the decision in great matters such as human liberties are made within the minds and hearts of individual citizens. I feel that it is up to all of us to raise our voices to bring about a realization of the need for resistance to temptation. Neither of the major political parties have shown ability to face the matter without considering the loss of votes of organized minorities."

Among manufacturers who were featured at NPTA's yearly session was George E. Williamson, president of Strathmore Paper Co., who faced industry conditions honestly and stated bluntly that to bring about predictions for the industry increased selling efforts and abilities are absolute requirements.

THE NAME PAPER is derived from the Latin word Papyrus.

CHINESE first used paper at an unknown date. By 156 B.C. they were making it from the pulp of the mulberry tree.



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1950 Review Number

PULP & PAPER

145

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TRI-CLOVER PARECATED STAINLESS STEEL HOUSTRIAL PUMPS

1

VALUE OF SALES IN U. S. INDUSTRY AND BY WHOLESALERS

Year	By Pulp, Paper, Board and Products Industries Millions of dollars	By Wholesale Distributors of Paper and Its Products Millions of dollars
1939	1.785	575
1940	2,064	595
1941		750
1942		752
1943	3,389	801
1944		835
1945	3.725	866
1946	4,523	1,338
1947		1,625
1948	6,622	1.575
1949*	6,399	1.437
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Estimate. Source: U. S. Dept. of Com merce.

APPA Issues New Edition Of "Statistics of Paper"

An enlargement and revision of "Statistics of Paper," official publication of the American Paper and Pulp Association, has been published.

The table of contents includes pulpwood, wood pulp, waste fibrous materials, paper, paperboard and paper products, and general summaries data.

Representing an accumulation of many years' data in the files of the association and combined efforts of the industry, the "Statistics" is a valuable addition to the statistical material on the industry. Copies may be ordered for \$5 each, post paid in U. S., from the APPA, 122 East 42nd St., New York 17, N.Y.

The $F.\,Y.I.\,$ column (FOR YOUR INFORMATION)

Pumps in Typical Kraft Mill

In a typical modern kraft mill in one of the Southern States, which makes pulp and converts it all to paper, producing from 220-240 tons a day, there are a total of 91 pump units. Total rated capacity for these pumps is 108,035 gallons per minute. Their total connected motor capacity is 3209 horsepower.

Here's the way this was broken down for stock, water, etc.:

For water: 26 pumps of 71,935 GPM with motor capacity of 1,965 hp.

For chemicals: 57 pumps of 27,650 GPM with motor capacity of 932 hp.

For stock: 8 pumps of 9,350 GPM with motor capacity of 312 hp.



- *KVP COMPANY OF TEXAS
- * HARVEY PAPER PRODUCTS CO.
- *THE KVP COMPANY LIMITED
- * APPLEFORD PAPER PRODUCTS LIMITED

MAMILTON - ONTARIO

PARCHMENT . MICHIGAN and Deven, Pennsylvania

Non-Paper Cellulose

RAYON, CELLOPHANE, PLASTICS, ETC.

Last year, at this time, when the survey for 1948 was being prepared, it was pointed out that the year 1948 might be a high point in the production and use of non-paper wood pulps. Such has proved to be the case as the statistics following will show. The production of dissolving pulps was considerably below that of 1948 and it may be 1951 or 1952 before the figures for 1948 are exceeded. As has been the practice, in these reviews, the pulps discussed will be those pulps that are purified above the usual chemical characteristics of pulp produced for paper. These are the wood pulps with the widest possible range of end use, ranging from photographic paper to nitrocellulose to textiles. Some groups classify these pulps as "dissolving and special chemical" but they are all pulps whose alpha cellulose content has been raised to 90% or

Again this year PULP & PAPER is indebted to Rex Vincent, technical director, Bulkley, Dunton Pulp Co., for assistance in making this survey, and also to Rayon Organon, published by Textile Economics Bureau, Inc., and the U. S. Pulp Producters Association, for some of the data.

In Table I below are statistics on these pulps compiled from various reports of the U.S. Pulp Producers Association. Notice that although the production for 1949 is down from recent years, it is more than double what it was in 1938.

Table I U. S. PURIFIED WOOD CELLULOSE

				Net
	Produc-			Avail-
Year	tion	Imports	Exports	able
1938	171,650	65,220	72,800	164,070
1940	288,500	113,945	115,204	287,241
1943	369,731	129,380	22,884	476,226
1944	429,545	132,675	10,729	551,491
1945	355,820	146,030	13,030	488,820
1946	295,680	198,540	9,300	484,920
1947	408,460	248,070	14,570	641,960
1948	421,924	239,842	14,665	647,101
1949	371,422	154,348	3,857	521,913

The exports of these pulps in 1949 were lower than for many years and emphasize the impact of the "dollar gap." Imports of these pulps show the second consecutive year of decline and as long as exports from the U. S. are down the imports will probably also be down. The net available figure for 1949 is 126,000 tons below that of 1948, a drop of 19%. U. S. production, however, was down only 11% while imports were down 35%.

This decline in imports is rather severe and the following table illustrates where this decline occurred.

Table II

U. S. PURIFIED WOOD PULP IMPORTS

		1948	1949
Canada		224,942	149,801
Sweden		9,080	3,888
Finland		3,718	
Norway	**********************	2,101	

Imports of these grades from Scandinavia have fallen drustically from the 1947 level of 23,700 tons. It is expected that 1950 will show about the same quantity as 1949 as there does not appear to be any consistent demand in the U. S. for these imported grades as long as they are available in North America. The continent is now self-sufficient in these grades of pulp and indications are that it will be for the next three to five years, at least.

Table III puts these figures on the basis of the North American continent. In this table, Canadian and American production are added, exports are those made from the continent and imports are those to the U.S. only.

Table III NORTH AMERICAN PURIFIED WOOD PULP

	Produc-			Net Avail-
Year	tion	Imports	Exports	able
1946	555,000		60,000	
1947	707,000	23,700	56,000	674,700
1948	754,000	14,900	80,400	688,500
1949	620,930	4,550	83,150	542,330

These brief data indicate that recently the trend of imports is down and exports are remaining about steady. If this situation were to continue, and it will as long as dollars are scarce abroad, the net available to North America could be about 690,000 tons. This is on the basis of full capacity operation and on the basis that several mills making both grades continue their operations on the current proportion of paper grade and dissolving grades.

By mid-summer the International Paper Co.'s mill at Natchez, Miss., will be in operation and this is planned to add 100,000 tons to the dissolving pulp capacity. It is not expected that this mill will immediately manufacture these grades if there is no demand for them, but the capacity to make them will be there.

By late 1950 or early 1951 the Celanese mill in British Columbia will be in operation and a further addition to the capacity of 60,000 tons will be available. Thus by early 1951 there will be a North American capacity of at least 850,000 tons per year. This figure is smaller than some others that have appeared, but it is a real-



MAP ABOVE SHOWS SITE OF Columbia Collules Co., Ltd., new 200 ten high cliphe sulfite pulp (cartylatine grade) being completed this year and scheduled to start producing purified pulp in early 1931 for the parent company, Colonese Corp. of America. Below is postcard view of Watson Island site near Prince Rupers. This curved railroad dock connected at both ands with island was left by U. S. Army and forms 30-acre mill pand.



istic figure that takes into consideration the fact that two companies producing small tonnages of these grades will not use their large capacities for dissolving pulps in the forseeable future.

There are other mills for the production of these pulps in the discussion stage but in view of the fact that current capacity was not used in 1949 and probably will not be used in 1950 and also that current capacity is already being expanded, these new mills will not soon get started, at least, not for the production of dissolving pulps. Last year it was reported here that five new mills were being talked about and it was said here that only one or two had a chance of getting off the drawing board. The plans for these mills were formulated during 1948 when there was not enough dissolving pulp available and when it seemed as though the demand was going to continue to grow. It is evident now that the growth of the consumption of these pulps is in a different

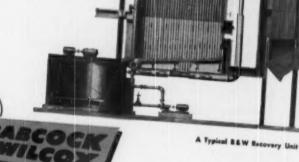
WELL DONE says a Southern Paper Co.

. . . as 2nd B&W Recovery Unit

Goes into Service

This customer reported that it was pleased with
the performance of the second B&W unit; also with
the cooperation given by B&W engineers in getting the unit
through when it was needed.

A pat on the back like this is tangible recognition of B&W's service, which traditionally extends far beyond contractual definitions of responsibility. This extra attention to customers' problems is an invaluable asset to executives responsible for economical, efficient capital investment. And it helps to explain why so many companies keep coming back to B&W for dependable, low-cost chemical recovery and steam-generating equipment.



F-50

NON-PAPER CELLULOSE-Cont.

phase and there is some shaking down going on and more to come.

This change in trend has been caused by several factors:

- 1. A drop in the production of rayon yarn.
- A decrease in the proportional use of wood pulp in rayon.

These factors were produced by the competition of other man-made fibers and the cost relationship between wood pulp and cotton linters. It was pointed out here a year ago, by Mr. Vincent, that cotton linters had fallen so low in price that on the basis of alpha cellulose they were actually cheaper than wood pulp and at that time it was pointed out that the use of wood pulp was bound to suffer. During the year the consumers gradually shifted from pulp to linters, even though the price of pulp dropped during the year. This shift was so wide that the price of linters began to rise again and early in 1950 was considerably above pulp and indications were that the price would go even higher. The law of supply and demand worked perfectly in this case and now that the linter price is up the shift is on back to wood pulp. If the production of rayon were to remain high this shift would react so favorably on pulp that capacity operations might again be resumed but there is a story on that, too.

Nylon is now going into many other articles of wear than hosiery. That was the first field where the displacement of rayon was effective. During 1949 rayon capacity was actually decreased while nylon and other synthetic fibers increased. DuPont's new nylon plant in Tennessee, which began commercial operations in the fall of 1948, was reported to be running at capacity by April of 1949. Plans were even then under way for expansion of that plant and also the one in Delaware. Union Carbide and Carbon, which has been producing dynel on a pilot plant basis, announced that increased production facilities would be available by the middle of 1950. The impact of these new fibers on rayon has been serious in some fields and must be closely watched. The competition of the five fiber groups, cotton, wool, rayon, silk and other synthetics is now very keen. In 1949 the consumption of all of them was down except the other synthetics, and they increased.

Since 1949 was a very different year from the point of view of consumption of these pulps it is important to know where the shifts and changes occurred. The balance of this review will be devoted to the consuming phase of the business.

In 1949 rayon consumed about 68% of the total supply of dissolving wood pulp of the U. S. In 1948 this figure was 67% and in 1947 it was 61%. This rising percentage can be misleading for it points out that other uses of purified wood cellulose are declining since the amount actually used in rayon is decreasing also. Table IV, which follows, shows the amounts of wood pulp and cotton linters used in the production of rayon in recent years. In 1948 both sources of cellulose gained over 1947 but linters gained more, rising to 19% of the total. Note that in

1949 wood pulp decreased but linters gained, coming back to 25% of the total, about where they were before the war.

These, and other statistics are from Rayon Organon, the statistical journal of the industry:

Table IV
CELLULOSE IN THE U.S. RAYON INDUSTRY

	Rayon	Wood Pulp		Linters	
Year	Production	Consumed	%	Pulp Consumed	%
	(Tons)	(Tons)		(Tons)	
1930	63.850	45,000	62	27,000	38
1935	131,077	86,000	63	51,000	37
1940	SAT FOR	178,000	75	60,000	25
1942	316,308	280,500	85	49,500	15
1944	361,977	285,000	78	82,000	22
1945	396,000	297,000	74	103,000	26
1946	427,000	323,000	75	105,000	25
1947	482,500	397,000	83	81,000	17
1948	562,000	435,000	81	104,500	19
1949		358,700	75	117,900	25
Source: Rayon	Organon.				

A breakdown of the 1948 and 1949 production of rayon by types is shown in Table V below.

Table V U. S. RAYON PRODUCTION BY TYPES

1948	1949
(Tons)	(Tons)
Viscose and Cupra-	
Ammonium fil. 281,150	272,150
Acetate filament 146,900	127,500
Viscose staple and tow 92,250	64,900
Acetate staple and tow 41,850	32,350
Account to the second s	-

562,150 The year 1949 was the first time the production of rayon declined from the year before since 1938. A total of 476,600 tons of purified cellulose was consumed by the industry, a drop in the total of 12% from 1948 but linter pulp increased by 13%. The increase pushed the consumption of linters in rayon to an all-time high of 117,900 tons. The decline in wood pulp was spread through both processes, viscose and acetate. The percentage of wood pulp used in the viscose process dropped from 87 in 1947 to 86 in 1948 and 79 in 1949. Most of this shift took place in the high tenacity yarns. With acetate the drop in wood pulp was from 68% of the total in 1947 to 65% in 1948 and 64% in 1949.

The rayon industry, young and husky as it was, has been marked by continual expansions in yarn producing capacity. 1949 marked another change in that the capacity of the industry decreased. Rayon Organon estimated the capacity of the industry in November of 1948 as being 581,000 tons. In early 1949 it was estimated that capacity would be as follows: July, 1949 623,000 tons March, 1950 627,000 tons October, 1950 627,000 tons

In January, 1950, a new survey was completed which revealed capacities to be as follows:

Nov., 1949 598,000 tons July, 1950 619,000 tons Early 1951 620,000 tons These estimates indicate that no new plants will be brought into production in the next 12 months. If the present plants were to operate at full capacity during the coming year, and if the relative position of linters and wood pulp were maintained, there would be enough wood pulp for the industry. This would probably be true even if linters lost some of their position.

Although rayon production declined in the U.S. during 1949, the same was not true in the rest of the world. Total world production in 1948 was 1,238,000 tons while in 1949 it was 1,354,000 tons. Thus while rayon production in the U.S. dropped 12%, production in the rest of the world increased 25%. In 1948 the U. S. production was 45% of the total and in 1949 it was only 37% of the total. This makes it obvious that the rest of the world has a greater demand for purified cellulose than does the U.S. An item in this change is noted in Sweden's export of dissolving wood pulps which was 334,-000 tons in 1948 and 366,000 tons in 1949.

CELLOPHANE

Cellophane is the other major consumer of dissolving grades of wood pulp. Rayon, as mentioned above, consumed about 68% of the total available to the U. S. and cellophane consumed about 22%. Both of these end-uses together account for 90% of all the purified wood pulp available as the statistics work out for 1949. There was a slight increase in the production of cellophane in 1949 over 1948 and it is estimated that 115,000 tons of wood pulp were consumed against an estimated 110,000 tons for 1948. There will be a further increase in the production of cellophane in 1950 and a large increase in 1951 when the new plant of Olin Industries comes into production, Mr. Vincent predicts. This new plant is expected to produce about 33 million pounds annually and this will require approximately 17,000 tons of wood pulp. The cellophane requirement for 1951 will, therefore, come close to 145,000

(Continued on Page 152)



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more than just selling quality starches,
dextrines and gums...
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NON-PAPER CELLULOSE-Cont.

Other miscellaneous uses of wood pulp by the viscose process or variations of it, which produce such items as sponges, seals, bands, caps, rayon straw and rayon horsehair probably consumed about 3,000 tons. No statistics are available for these items.

CELLULOSE PLASTICS

Again there are no statistics for these materials except those published for sheets, rods, tubes and moulding powders. Those shown in the table below include these items and also include the fillers and plasticizers used in the moulding powders. They do not include nitrocellulose used for lacquers and film.

Table VI U. 5. PRODUCTION OF CELLULOSE PLASTICS (short tons)

Cellulose

Acetate— 1946 1947 1948 1949 Mixed Esters 51,534 38,722 32,750 37,535 Nitrocellulose... 9,080 6,442 5,102* 3,544 Other

Cellulosics 6,092 4,763° 3,993

These statistics do not show a prosperous picture for the cellulose plastics. Their production has been in a steady decline for several years and only the appearance of a cheap acetate moulding powder was able to check the decline in the acetate and mixed ester group. These plastics have been too high in cost to compete with the many newer developments but now that their raw materials, pulp, alcohol, acetic acid and etc. have come down in cost they may be able to come back. However, the chances are not good that this group as a whole will show any major signs of new growth. Over the past three years the consumption of cellulose plastics dropped 38% while in the same period total plastic consumption increased 27%. At present these plastics account for only about 10% of the total plastic consumption. In accounting for the distribution of the consumption of purified wood pulp it is estimated that the plastic group as a whole consumed about 18,000 tons.

MISCELLANEOUS USES

This is a wide grouping of end products, including everything from facial tissues to vulcanized fiber and photographic paper. Because of the variety of products and the constant shifting of formulations this group is very difficult to evaluate for the consumption of pulp. Some of these changes vary from month to month, depending upon the availability of certain fibers. A considerable quantity of rayon rejects are again being used in paper, particularly in facial tissues and facial type toilet and it is impossible to do anything but estimate, according to Mr. Vincent. The following table groups together figures reported by the Bureau of Census covering the major grades of paper using these pulps. These figures represent the production of the papers themselves and not the amounts of pulp used.

Table VII U. 5. PRODUCTION OF SPECIALTY PAPER AND ABSORBENT ITEMS (In Tons)

	Vulc.	Impreg.	Sanitary	Facial	
	Fiber	Stock	Napkins	Tissues	
1942	29,442	8,540	37,610	89,194	
1943	32,167	24,445	39,825	83,696	
1944	27,358	29,155	41,389	79,612	
1945	21,703	31,017	41,467	80,333	
1947	32,805	28,792	34,069	127,564	
1948	30,387	35,204	43.672	132,543	

An item not shown in the table is facial type toilet tissue which is growing rapidly, increasing from 48,100 in 1947 to 68,800 in 1948 and even higher in 1949, although statistics are not yet available for that year. It must be pointed out that much of the impregnating stock in the figures above is kraft paper made for phenolic impregnation and the sanitary napkin stock is the wadding type not necessarily using the dissolving grade of pulp. The significant item in the table is the increasing production of facial tissues which are getting to the point in production and required softness that they may not be able to get along on the quantities of rejects available to them and may have to use prime rayon pulp in order to have enough of this type of fibre.

NON-PAPER CELLULOSE EXPORTS

This is an enigma but it is an interesting one because of the hope for expansion of American dissolving pulps in foreign trade, says Mr. Vincent. Sweden can probably continue to take care of the requirements of Continental Europe but it is doubtful if they can compete in the Orient. Japan is recovering slowly but in 1949 they are reported to have increased production of rayon up to 63,000 tons; an increase of 78% over 1948. The entire question of exports of North American dissolving pulps resolves around currencies and as that situation improves the exports will grow. There is no question as to qualities of North American pulps, as they are the best produced in the world, due primarily to the trees of the West Coast.

SUMMARY

Table VIII sums up the consumption of purified wood pulp for the two years 1948 and 1949, as outlined in the foregoing sections.

Table VIII CONSUMPTION OF PURIFIED WOOD PULP (In Tons)

Total net for	1948	1949
North America	688,500	542,330
Consumed in Canada	17,600	19,850
Increase in Inventory.	8,000	4,000
Net for U. S.		
Consumption	662,900	518,480
Viscose and		
Acetate Rayon	_435,000	358,700
Balance	.227,900	159,780
Cellophane	110,000	115,000
Plastics	28,000	18,000
Misc. Viscose	4,500	3,000
Special Papers	33,000}	
San. Napkins, Vul.,	}	23,780
Fibre Misc.	52,400	

It must be emphasized that the statistics in the table above are not uniform in their origin. Some of them are gathered and reported by various agencies and some of them, by necessity, are Mr. Vincent's best estimates.

U. S. FIBER CONSUMPTION

(Units are Millions of Pounds and Percent)

			Millions o	/ Pounds					Percen	t of Tota	nI.	
			Man-Ma	de Fiber					Man	-Made		
Year 1920 1925 1927 1930 1932 1938 1942 1944 1946 1947 1948	Cotton 2,828,1 3,074,7 3,587,7 2,610,9 2,463,3 3,470,2 918,7 5,636,7 4,792,4 4,803,3 4,668,1 4,447,5 8,55,1	Woof 314 2 349 9 354 1 263 2 230 1 406 1 284 5 616 2 622 8 748 1 708 3 704 5	Rayon 8 7 58 2 200 0 118 8 155 3 322 4 329 4 620 8 704 8 875 5 987 9 1 149 5	26 0 49 0 56 0 50 0 75 0	Silk 29.2 66.0 71.6 75.7 70.5 57.8 51.7 5.0 0.6 6.5 2.0 7.4	Total 3 180 2 3 548 8 4 113 66 6 2 919 2 4 256 3 3 584 3 6 904 7 6 169 6 4 16 3 6 383 9 6 383 5	Cotton 88 9 86 6 87 2 85 0 84 4 81 5 81 4 81 6 77 7 74 0 72 8 69 7 70 6	Wool 9.9 9.9 8.6 8.6 7.9 9.5 7.9 8.9 10.1 11.5 11.0 11.0 9.4	Rayon 0 3 1 6 2 4 3 9 5 3 7 6 9 2 9 0 11 4 13 5 15 4 18 0 18 2	0.4 0.8 0.9 0.8 1.2	Silk 0.9 1.9 1.8 2.5 2.4 1.4 1.5 0.1	Tota 100 100 100 100 100 100 100 100 100 10

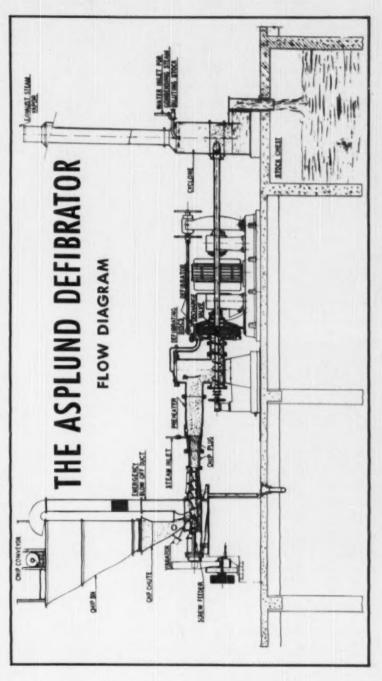
Source: Rayon Organon, partly compiled from U.S. Census. Other Nylon, Vitron, Fiberglas, Orlon, Dynel, Saran, etc.

OTHER PULP AND PAPER PLASTICS

Besides what might be called the purified cellulosic plastics, discussed in the preceding article, there is also a field of plastic uses for paper and wood pulps, lignin or wood flours.

Lignin from wood pulp has been used in products such as Howard Smith Paper Mills of Canada are making in their new Arborite plant in West Montreal, as St. Regis makes in its Panelyte divisions—a new plant is being completed this summer at Kalamazoo; another one is announced for St. Johns, Que., and the parent plant is at Trenton, N. J. Lignosite, used as cement binder and for other purposes, is made by Puget Sound Pulp & Timber Co., and Marathon and Weyerhaeuser make molding powders. Lignin is recovered in waste liquors or from waste wood for products.

Arthur J. Norton, nationally known authority on plastics using paper, lignin,



In one continuous, economical process, the board, hardboard, insulating board and Asplund Defibrator produces pulp for wallroofing felt-from all kinds of chipped wood, or from other fibrous ligno-cellulose materials such as bagasse or straw.

nical advice on defibration is available Asplund pulp is homogeneous and free, with individual fibres intact but well separated, and it has good felting properties. The yield is high, and production costs are low. Techwithout obligation.

HERICAN DEFIBRATOR, INC. ONTSIR PULDING

NON-PAPER CELLULOSE-Cont.

wood flour, etc., has again prepared his exclusive estimates of yearly production for PULP & PAPER, shown in the table below.

Paper base laminates have leveled off somewhat in recent years. The use of paper in this manner, says Mr. Norton, will not increase until the long forecasted overlay work in plywood and other composite panels really starts. It has been predicted authoritatively that 25% of plywood will be "overlayed" in this manner as the resources in large peeler logs decreases and inferior woods must be used, with resin-paper or pulp strengthening. The latter have been declared to make even a superior product. Over 35,000 tons of paper or pulp would be used for this purpose alone.

The overlay work as predicted should start soon, said Mr. Norton, or otherwise panel production will take the same type of drop that molding compounds did. "It takes time and effort to sell new products." he observed.

The use curve of phenolic molding powders filled with wood flour was by no means "a straight line" up or down as shown in the yearly data below, he explained. The drop from the postwar high actually started in October, 1948. In September, 1948, he said, nearly 10,000 tons were made. By July, 1949, this had dropped to little over 2,000, but since then the curve has been upward and by December was back to 6,200 tons per month. This wide fluctuation was due to a filling-up of inventories, conventional post-war articles, he said, and "a lack of good selling, which held back the rebound."

Television cabinets and selling in new fields should soon bring the total back to 80,000 tons, Mr. Norton predicted. About 10,000 tons of molding powder using a fraction of Douglas fir bark was made in 1949 in a West Coast pilot plant.

Pulp moldings grow slowly, he commented. The figures given do not include the formed fiber boards used in the automobile industry for door paneling, etc.

U. S. LAMINATES AND MOLDS PRODUCTION — PULP AND PAPER PLASTICS

(In Thousands of Yons)

Estimates made especially for PULP & PAPER by Arthur J. Norton, consulting chemist who has been closely identified with these developments in New England and the Middle West and now makes his headquarters in Seattle.

Wood

	Paper aminates aper plus resins) l	in Paper		Pulp Mold- ings
1940	10	7	2	- 1
1943	40	20	2	1
1944	40	20	3	2
1945	40	20	17	2
1946	30	15	35	3
1947	30	1.5	80	3
1948	35	17	50	3
1949	35	17	60	3.5

WORLD RAYON PRODUCTION

(in Millions of Pounds)

	Filament Yarn	Staple Fiber	Total Rayon	U.S. Pct. of Total Since 1940
1890	.03		.03	*****
1900	2		2	
1910	17		17	
1920	3.3		33	
1930	451	6.	457	
1935	941	139	1,080	
1940	1,186	1,285	2,491	19.1%
1943	1,153	1.392	2.545	26.1%
1944	1,033	1.052	2,985	34.7%
1945	897	501	1,398	56.75
1946		574	1.677	50.95
1947	1.316	684	2.012	48.5%
1948	1.557	920	2,477	45.4%
1949	1,640	1.050	2,690	36.9%

Another interesting industry development is the new company, Plastics Specialties, which is operating at Trenton, Mich. It makes resin-treated materials and works with papers, fabrics and sheetings. Some of its specialties include translucent overlays and printed decorative patterns.

A look at likely things to come is typified by the Armour Research Foundation's development of a technique for making furniture from wood pulp. It has produced in a pilot plant seats and backs to be attached to metal legs. After a special method has been followed to form the wood fibers, resin-solution saturations are accomplished and the surfaces are finished in hydraulic molds.



ARMOUR RESEARCH FOUNDATION OF ILLINOIS INSTITUTE OF TECHNOLOGY, Technology Center, Chicago, has produced this wood pulp molded chair, with special resin-solution saturations. Surfaces are finished in hydraulic molds.

An assured new production for the Middle West is the changeover St. Regis is making at the former Time, Inc., coating mill at Kalamazoo. St. Regis will produce Panelyte plastic pulpboard here. When ready for Panelyte manufacturing the new plant will turn out the laminated decorative items for table and counter tops and many household and industry uses. Kraft paper is the base for the col-

U. S. PRICES OF DISSOLVING

Prices are per 2,000 pounds, air dry basi (10% moisture content), freight equalised for gross weight on respective Atlantic Besboard of Oulf ports through Feb. 1947. Thereafter price are Lo.b. producing mill, with full freight allowe to consuming plants.

		For Regular Viscose	For High Tenacity Viscose	Acetate & Capra Rayon
May	1938	 \$ 85		
Feb.	1939	19		\$100
Full	1940	85	\$100	100
	1943	81	100	110
	1944	25	100	110
Jan.	1946	10736	11234	1174
	1946	122	12732	138 3
Feb.	1947	139	147	158
Dec.	1947	 149	158	172
Mar.	1948	157	167	182
July	1948	164	174	190
June	1949	 159	168	178
Oct.	1949	150	161	171

CANADA Dissolving Pulps

Canada continued to manufacture and use increasing quantities of rayon grades of pulp last year, and production will probably be considerably higher this year as a result of current expansion.

Principal producers of dissolving pulp in Canada today are Canadian International Paper Co. and the Fraser Companies in Eastern Canada, and B. C. Pulp & Paper Co., with mills at Port Alice and Woodfibre in the West. Canadian International's Hawkesbury mill is

Canadian International's Hawkesbury mill is now undergoing extensions costing approximately \$1,000,000. Fraser Companies' principal factor in the dissolving pulp field is its mill at Atholyille, N. B.

The biggest and most interesting development in the dissolving pulp field in Canada is now taking place at Watson Island, near Prince Rupert, B. C., where Columbia Cellulose Co., subsidiary of Celanese Corp. of America, is building a mill to produce high alpha pulp to be in operation early in 1951. Canadian Western Lumber Co. announced plans for a discolving pulp mill to be built at Duncan Bay, near the mouth of the Campbell River on the east coast of Vancouver Island, utilizing salvage logs primarily during its first ten years of operation. Under agreement for timber with the British Columbia government the company has until 1952 to start construction.

CANADIAN RAYON

Yarn Production	Yarn Imports	Staple Fiber Imports	Total Con- sumption
1925 507 528 1930 4 627 327 1935 13 215 617 1940 19 637 869 1945 21 100 000 1947 25 421 000 1948 29 175 000 1948 000 1000 1948 000 1000 1948 000 1000 1948 000 1000 1948 000 1000 1948 000 1000 1948 000 1000 1949 000 1000	2 383 794 1 214 656 3 482 255 7 584 477 5 379 949 6 885 388 6 805 375	4,180,609 6,841,301 12,507,870 9,408,472 10,139,869 military tire y	2,359,030 7,011,121 14,430,273 25,574,864 35,525,748 44,408,819 46,918,860 50,000,000

Rayonier Sets New Record In Sales for Textile Market

President Edward Bartsch, of Rayonier Incorporated, said in late April that tonnage sales of purified wood cellulose to the chemical textile fiber industry, principal user of Rayonier's products, were the highest for any single quarter in the company's history in the first quarter of 1950, and that customers' demand continues strong.

Rayonier, leading producer of highly purified wood cellulose, in its quarterly report, shows first quarter, 1950, sales of \$14,945,295 compared with \$13,351,147 for

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Regulates the consistency of all types of stocks, slow or free. Regulates difficult stocks such as rags, dirty waste paper, or free sulphite, and is not affected by the presence of knots, slivers, etc. A Foxboro instrument and Foxboro Stabilflo diluting water valve do the work efficiently, dependably and maintain consistency regulation to 1/10 of 1%. Many mills report much closer control.

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NON-PAPER CELLULOSE-Cont.

the corresponding period of 1949. Net income for this period of 1950 amounted to \$2,322,050, and in the first quarter of the previous year amounted to \$2,016,422.

Consolidated balance sheet of the company and subsidiaries as of March 31, 1950, shows assets of \$22,632,446 and liabilities of \$5,924,746.

United Kingdom Rayon

Production of rayon in the United Kingdom during 1949 totaled 289,800,000 pounds, the highest annual figure ever attained by the industry and an increase of 24% over the previous record year's output of 222,800,000 pounds in 1948. Parenthetically, it should be noted that the above figures include nylon for 1949 but not for 1949.

The 1949 production of filament yarn in this total amounted to 171,500,000 pounds, an increase of 17% over the 146,700,000 pounds produced in 1948. On the other hand, the output of staple at 117,300,000 pounds increased by 37% over the 85,900,000 pounds produced in 1948.

Wood Pulp Use In Rayon Tire Cord

A major use for purified wood pulp is in tire cord. It is exclusively used in the rayon type, which has far outstripped cotton fabric, due primarily to wartime military development.

The 1949 production of tire cord and fabric (including chafer fabric) in the U. S. amounted to 447,000,000 lbs., a decline of 18% from the 542,000,000 lbs. produced in 1948, but 66% greater than 1939.

Outstanding feature is the continuing increase in the production of rayon (wood pulp) and nylon tire fabric cord to the entire detriment of cotton, the 1949 production of rayon and nylon amounting to 282,000,000 pounds or over 30 times as large as the output ten years before.

PRODUCTION OF TIRE CORD & FABRIC (Except Chafer Fabric—according to Rayon Organon)

	io nay	an an He	age wood	
	Mill	ions of Pou	nds	5%
	Cotton	Rayon*	Total	Rayon
1939	243	9	252	4%
1945	224	189	413	46%
1947	285	214	499	43%
1948	226	250	476	53%
1949	113	282	395	71%

Rayon Production-Japan

According to figures released by the Japan Chemical Fiber Industry Association, training 1949 and 1949 pounds, a 78% increase over the 1948 output of 70,989,000 pounds. Rayon filament yarn production was reported at 66,737,000 pounds, an 87% increase over the 35,722,000 pounds produced in 1948. The 1949 rayon staple output was reported at 59,576,000 pounds or 69% larger than the 35,287,000 pounds produced in the previous year.

U. S. Rayon Producers

Here is complete list of U. S. rayon producers, most of whom purchase dissolving wood pulp.

There are six rayon plants in Virginia; five in Tennessee; three each in Ohio and Pennsylvania; two each in Connecticut, New York and West Virginia; one each in Delaware, Georgia, Maryland, Massachusetts, North Carolina, Rhode Island and South Curolina. One is being built in Alabama. This totals 31. Viscose process is used in 23 plants, acetate in seven, and cupramunonium in two.

Here is list of producers, home offices, plant addresses and processes used:

American Bemberg Corp. (Cuprammonium yarn) 261 Fifth Ave., New York 16, N. Y.; plant, Elizabeth, Tenn.

American Enka Corp.—(Viscose yarn) 266 Madison Ave., New York 16, N. Y.; plants. Enka, N. C., and Lowland, Tenn.

American Viscose Corp.—(Viscose and acetate yarn, Viscose staple) 1617 Pennsylvania Blvd., Philadelphia 3, Pa.; plants, Viscose Rayon: Front Royal, Va.; Lewiston, Pa.; Marcus Hook, Pa.; Nitro, W. Va.; Parkersburg, W. Va., and Roanoke, Va. Acetate rayon—Meadville, Pa.

Beaunit Mills, Inc.—(Viscose yarn) 450 Seventh Ave., New York I, N. Y.; plant, Coosa Pines, Ala. (under construction).

Celanese Corp. of America—(Acetate and Viscose yarn and acetate staple) 180 Madisson Ave., New York 18, N. Y.; plants, Acetate Rayon: Rome, Ga.; Cumberland, Md.; Rock Hill, S. C., and Narrows, Va. Viscose Rayon: Rome, Ga.

Cupranium Mills, Inc.—(Cuprammonium yarn) Brooklyn, Conn. (near Danielson); plant, Brooklyn, Conn.

Delaware Rayon Co.--(Viscose yarn and straw) New Castle, Dela.; plant, New Castle, Dela., R.D. 2.

E. I. Du Pont de Nemours & Co., Inc.—(Viscose and acetate yarn and staple) Wilmington 98. Dela.; plants, Viscose Rayon: Buffalo, N.Y.; Old Hickory, Tenn., and Richmond, Va. Acetate Rayon: Waynesboro, Va.

Hartford Rayon Corp.—(Viscose yarn, horsehair and straws) Rocky Hill, Conn.; plant, Rocky Hill, Conn.

Industrial Rayon Corp.—(Viscose yarn) 660 Union Commerce Bidg., Cleveland 1, O.; plants, Cleveland, Painesville, O., and Covington, Va.

National Rayon Corp.--(Viscose yarn) 1294 West 70th St., Cleveland 2, O.; plant, Cleveland.

New Bedford Rayon Co. (Viscose yarn) P.O. Box 908, New Bedford, Mass.; plant, New Bedford, Mass.

North American Rayon Corp.—(Viscose yarn) 261 Fifth Ave., New York 16, N. Y.; plant, Elizabeth, Tenn.

Skenandoa Rayon Corp.—(Viscose yarn) 450 Seventh Ave., New York 1, N. Y.; plant, Utica, N. Y.

Tennessee Eastman Corp. (Acetate yarn and staple) Kingsport, Tenn; plant, Kingsport, Tenn. This company has adopted the ASTM proposal to call man-made cellulose ester fibers "estron."

Woonsocket Rayon, Inc.—(Viscose yarn), 443 Clinton St., P.O. Box 70, Woonsocket, R. I.; plant, Woonsocket, R.I.

Murdock Reports on Japan's Rayon Pulp Industry

In a communication to PULP & PAPER, Harold Murdock, former head of the Pulp & Paper Branch, National Resources Section, of General MacArthur's advisory industrial set-up in Japan, and now with Robert and Co. Associates, reports as follows on the Japanese rayon pulp industry:

The seven Japanese rayon pulp mills with 24 digesters and capacity for 218,000 tons a year, can produce pulp adequate for the production of high-grade rayon products, but they face many difficult operational problems. A plan for doubling the production of rayon pulp estimated in the ESB plan of 1948, using the same over-all amount of allocated pulpwood and producing the same tonnage of paper, is proposed.

"In the peak year of 1941, Japan's rayon mills produced 326,459 short tons of rayon pulp, of which 219,585 short tons came from mills located in Japan proper. Some of this rayon pulp production probably was not used by the rayon industry, because in 1941 the production of filament and staple rayon fibers was only 234,350 short tons. In any event, it is apparent that Japan became self-sufficient in regard to rayon pulp. This integrated situation accounted, to a large extent, for the stability and aggressiveness of the rayon spinning industry.

"World War II upset the entire structure of the rayon industry. Military authorities dismantled spinning equipment to obtain parts for war needs. Onethird the capacity was lost when Russia occupied Korea and Karafuto. Bombing took its toll. Only 26,290 tons were produced in 1947.

"Today there is justification for criticizing the lack of uniformity in quality of the Japanese rayon pulps. However, the lack of uniformity is essentially due to the fact that demand for their product has not been sufficient to keep the rayon pulp mills operating more than 30% of their capacity. Even at this low rate of production, the pulp mills have had to make one-half of their products for the paper industry, because they did not have sufficient demand from the spinning industry for rayon pulp.

"Japan should select its best rayon pulp mills and keep them operating continuously on quality rayon pulps at full plant capacity.

"Because Japan is overcutting its saw (Continued on Page 164)

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HAROLD R. MURDOCK, Chemical Engineer

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Scrolls for the Emperor

The art of making paper from fibrous matter has been traced back some 2,000 years to the ancient Chinese. Scholars credit Ts'ai Lun with the making of the first true paper during the reign of the Emperor Ho Ti from the bark of trees, hemp and discarded cloth. In 1873 the Swedish engineer, C. D. Ekmann, perfected a process for making high grade paper pulp by cooking wood chips with calcium bisulphite.



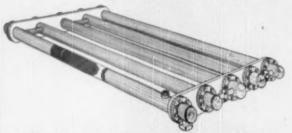
Today the pulp and paper industry is one of the major consumers of Sulphur, taking about 400,000 long tons annually. Compounds of Sulphur are indispensable reagents in the two major cooking processes for converting wood to pulp. From the pulp come newspapers, magazines, books, boxes, wrappings and an almost endless list of other paper products.

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velocities high enough to insure turbulence and low enough to prevent chatter. Also, for maximum efficiency a uniform "temperature difference" must be maintained from inlet to outlet. This is accomplished by using a full contra flow unit as shown in the illustration. The number of tubes, the shell size and the baffle spacing are all exactly calculated so that with prescribed quantities of fluids to be handled proper velocities and high heat exchange coefficients are obtained.

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Three Mills Pushing 1,000 Tons a Day of News

The three top hitters in the world newsprint league are Powell River Co., Canadian International Paper Co. and Bowater's Newfoundland Pulp and Paper Mills.

This refers, of course, to individual mill records and not to total output by companies. In the latter category, of course, CIP with its several newsprint producers would be well out in front.

So far as the records go for single mills, Powell River Co. has hit what is believed a world record (outside of craft)—1,021.6 tons on eight machines on March 21, 1950. It has averaged about 960.

CIP's big Three Rivers mill has been turning out an average of 920 tons daily. Bowater's mill at Corner Brook has achieved high tonnage since its new machine went into operation last year.

Powell River's achievement is due to its new No. 2 machine. This has attained a speed of 1550 feet, with daily average production of about 194 tons of saleable news grade paper daily. It has actually produced as much as 209.8 tons in 24 hours (on March 22, 1950).

Powell River engineers have a method of determining their machines' efficiency by establishing a theoretical output of pounds of newsprint per inch per hour, and then comparing that with the actual performance.



MORE OFFICE SPACE AND PLENTIFUL PARKING SPACE for employes and custemers have been obtained by Fibreboard Products, Inc., with a mave of headquarters to two rebuilt top floors of a 7-storp building at 1789 Montgomery \$1., Sun Froncisco, shown in this view of the Bay City, th has a 2,000 at, p. parthouse cafeteria and reaf garden for employes. New headquarters face the Embarcadero apposite Pier 31, and provide more than 45,000 sq. ft. of office space, sufficient to meet all foreseeable demands for the next 10 years, according to T. N. Blund, Vice President and General Manager. This space had been used for warehousing.

Southern Meeting Draws Record Attendance

Largest attendance on record was achieved at the spring meeting of the Southern Payer Trade Association, March 3, in Jackson, Miss., according to C. D.

Hurt, association secretary and counsel. W. G. Leathers, New York, secretary of the national association, was the principal speaker. Charles R. Liebman, National Paper Co., Atlanta, Ga., is association president. The meeting discussed plans for the annual session in September.



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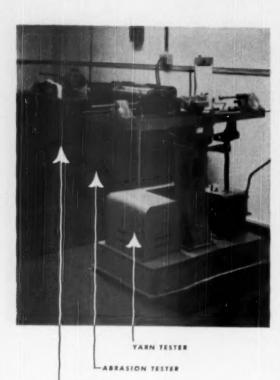
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NON-PAPER CELLULOSE-Cont.

timber to such an extent, an increase in pulpwood allotment can hardly be expected. The paper industry now has only one-sixth of the pulpwood needed to reach the level of paper production prior to 1941. However, even under these limiting factors, solution of the present paper and rayon pulp problem is possible.

"One solution to the problem is greater use of the semichemical pulping process which was recently introduced into Japan's pulp mills and is showing gratifying results. Pulps stronger than the regular sulfite production have been produced daily. Yields of 65-70%, based upon dry wood, are reported, compared to an average yield of 42% in the regular sulfite

"Another way to improve the pulpwood situation is to encourage the use of beech and other hardwoods in the northern Honshu rayon pulp mills. At least one well-equipped rayon pulp mill in Japan is now producing good rayon pulp from equal parts of beech and red pine.

"The Natural Resources Section plan proposes: (1) that no regular sulfite pulp be produced: (2) that semichemical sulfite pulp be produced instead, with a 30% saving in pulpwood; (3) that this saving in pulpwood be utilized to double rayon pulp production; and (4) that the very small soda pulp operations, distributed all over Japan, obtain their pulp requirements either from the larger, more economically operated mills or from annual straws available in their locality."

A Report On World **Paper Industry Conditions**



The paper industry in Great Britain is working hard, but under tremendous difficulties imposed by the Socialist government, says George G. Cobean (right), president of Bulkley, Dunton Paper Co., S. A., in an exclusive

interview for Pulp & PAPER.

Mr. Cobean last year completed an eight months' round-the-world trip in which he traveled 37,538 miles, spent 1701/4 hours in the air, 78 hours on the rails, and 72 hours in motor cars in countries all over the globe.

The mills in Great Britain must purchase pulp from the government, according to Mr. Cobean and must store it themselves as it becomes available although it need not be paid for until

Mr. Cobean told about seeing paper from Austria in far eastern markets and considerable Japanese paper is also appearing in the far east, chiefly in supercalendered book grades.

Things were generally topsy-turvy in the far east during the time of his visit -just prior to the big Communist pushbut Hong Kong and Singapore were bright spots. So were Ceylon and Pakistan, the latter looking forward to an infant paper industry. India already has a well developed paper industry, making about 85,000 tons against a consumption. of 140,000 tons from bamboo pulps mixed with imported chemical pulps. Due to the population factor, Pakistan has a much more favorable balance of trade than India.

France has shown much improvement, Mr. Cobean said, and particularly improvement is visible in Italy. Bavaria is another bright area, he stated. He believes that the Marshall Plan has been eminently successful.

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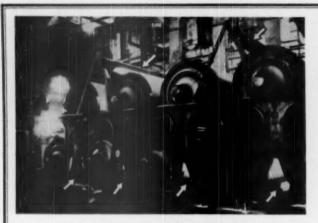
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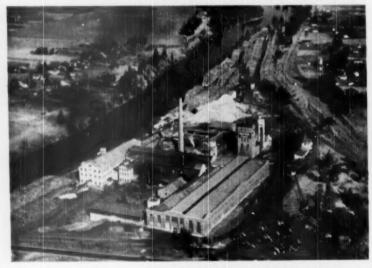
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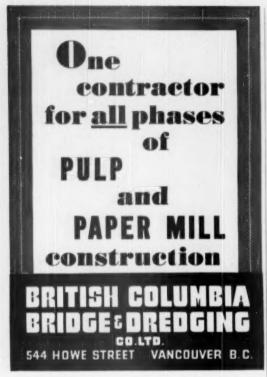
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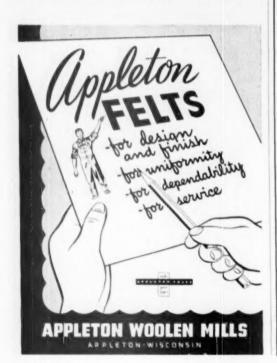


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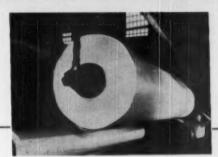
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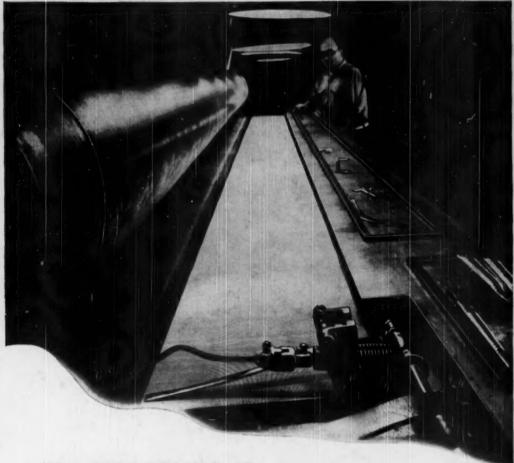
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